Draft User Guide

for

Regional Transportation Monitoring Information Systems

Southern California Association of Governments

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1 OVERVIEW

The Regional Transportation Information System, RTMIS, is a transportation information monitoring and performance assessment application, which aids in monitoring and assessing the performance of the current transportation system against regional goals. RTMIS assists with satisfying the growing demand for transportation data to assess current performance, plan improvements, and monitor effects. It provides support services for a number of SCAG interagency groups such as Regional Planning as well as regional partners and other agencies.

RTMIS is comprised of multiple components including several automated data collection applications and a web interface. Through the web interface, RTMIS provides access to a broad spectrum of regional transportation information collected from a variety of agencies such as Caltrans, county transportation commissions and local jurisdictions. RTMIS's web interface provides users with access to infrastructure inventory data such as roadways, number of lanes, and posted speeds along with operational characteristics such as traffic volumes and travel times.

2 APPLICATION FUNCTIONS

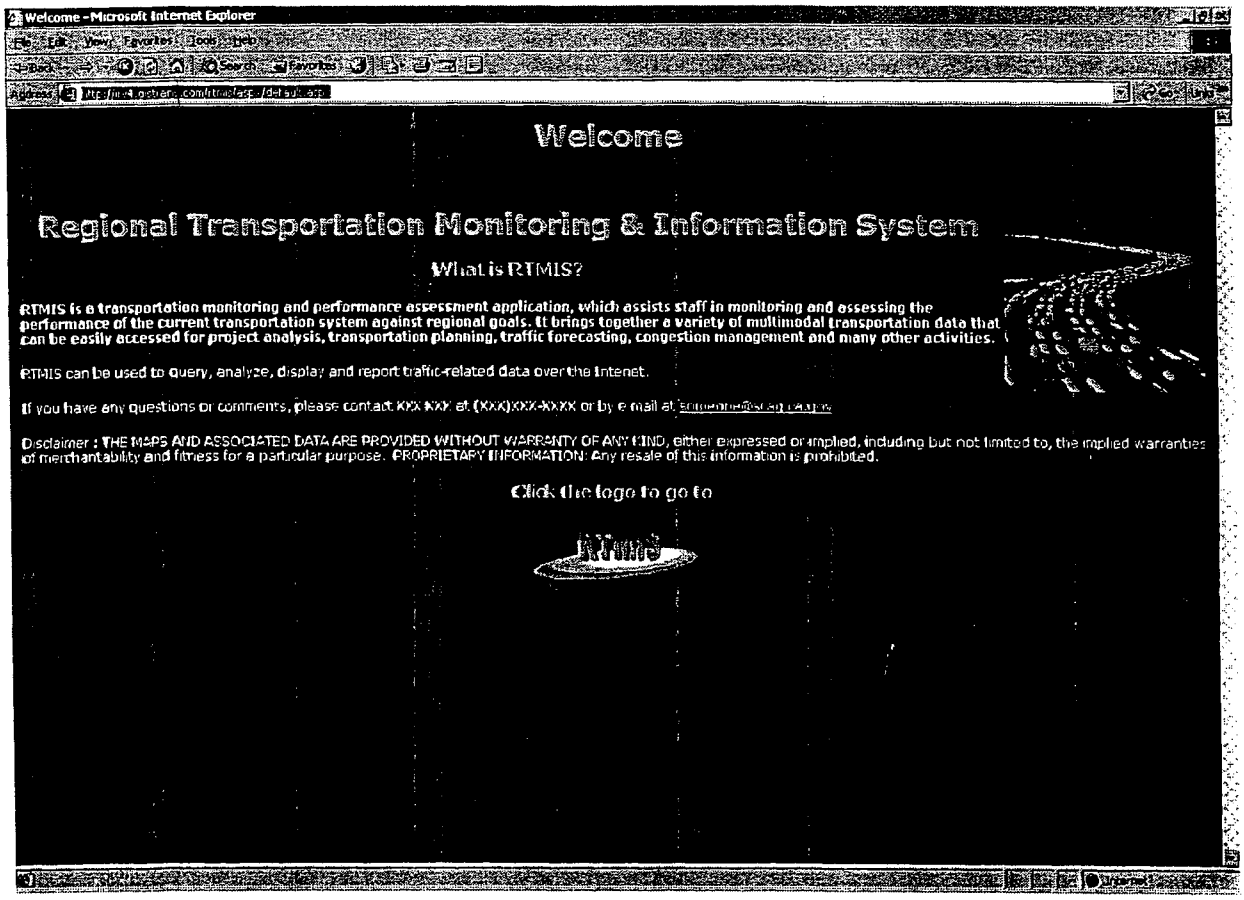
An important component of RTMIS is its ability to provide users with the ability to view, query, monitor, and edit transportation data. The RTMIS's web interface, which will be detailed in this user guide, provides these functionalities by integrating mapping functions with database queries in an interactive setting.

2.1 ACCESSING THE APPLICATION

RTMIS was developed for Internet Explorer 5.5 or greater browsers. The web interface can be accessed through the following URL:

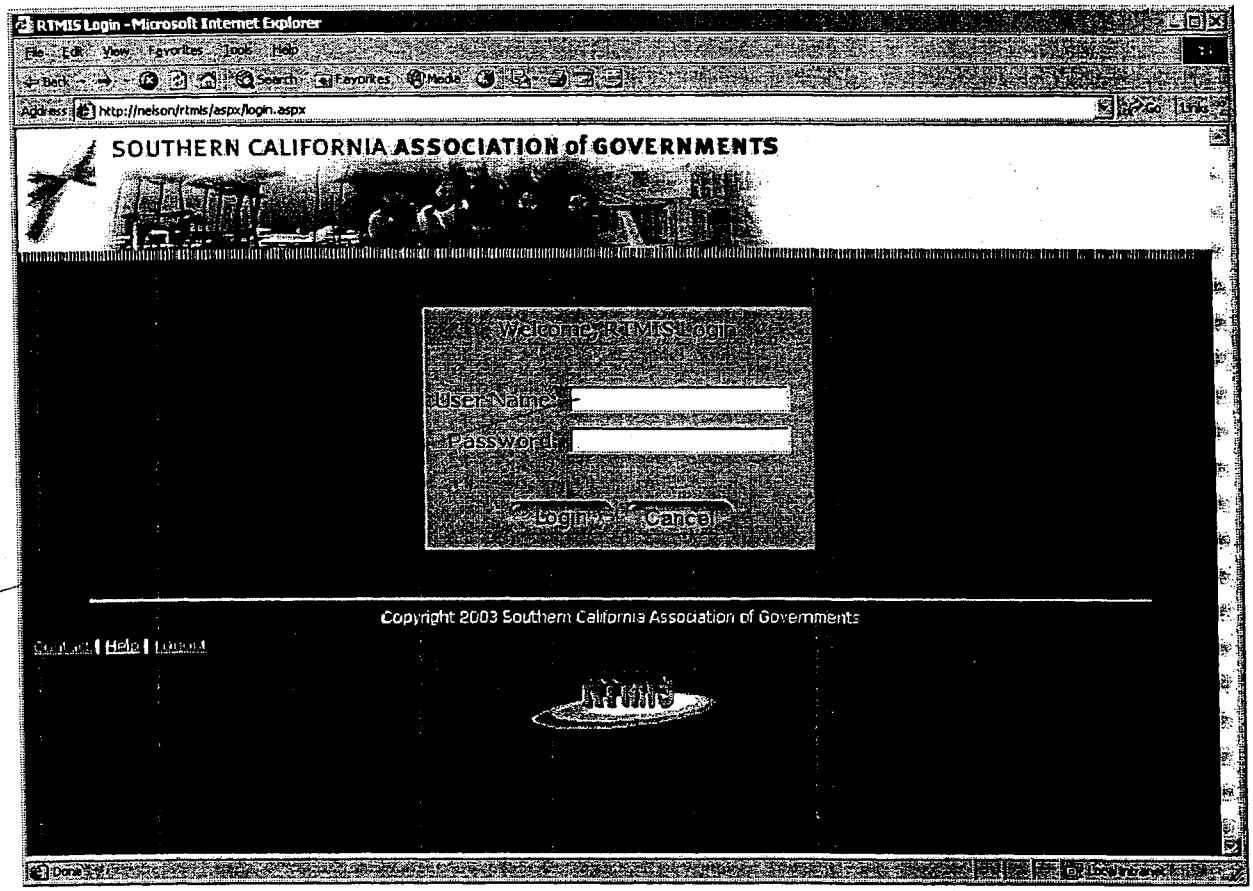
To access the application, open an Internet Explorer web browser, version 5.5 or greater, and enter the URL above into the address bar and press the 'Enter' key. This action will send a request for a specific resource, the RTMIS *Welcome Page*. The RTMIS *Welcome Page*, Figure 1 below, will then display presenting a brief introduction to the application. To enter the application, click the RTMIS logo located at the bottom of the page.

Figure 1. RTMIS Welcome Page



To access RTMIS, users must log into the application. When the RTMIS logo on the *Welcome Page* is clicked a *Login Page* will be displayed, Figure 2 below. Once a valid username and password have been entered, click the Login button to proceed into the application.

Figure 2. RTMIS Login Page



RTMIS supports various levels of users; as a result all users can access certain functionality while other functions are only available to specific users. The next section will discuss user classifications in further detail.

2.2 USER CLASSIFICATIONS

RTMIS utilizes a login security system comprised of user accounts defined with specific authorization classifications or roles. User roles were implemented to provide flexibility to RTMIS and to allow certain functions or data to be shared unrestricted while retaining the ability to easily protect or restrict specific functions such as data editing capabilities. The system administrator should be contacted to address specific user role assignments or requests.

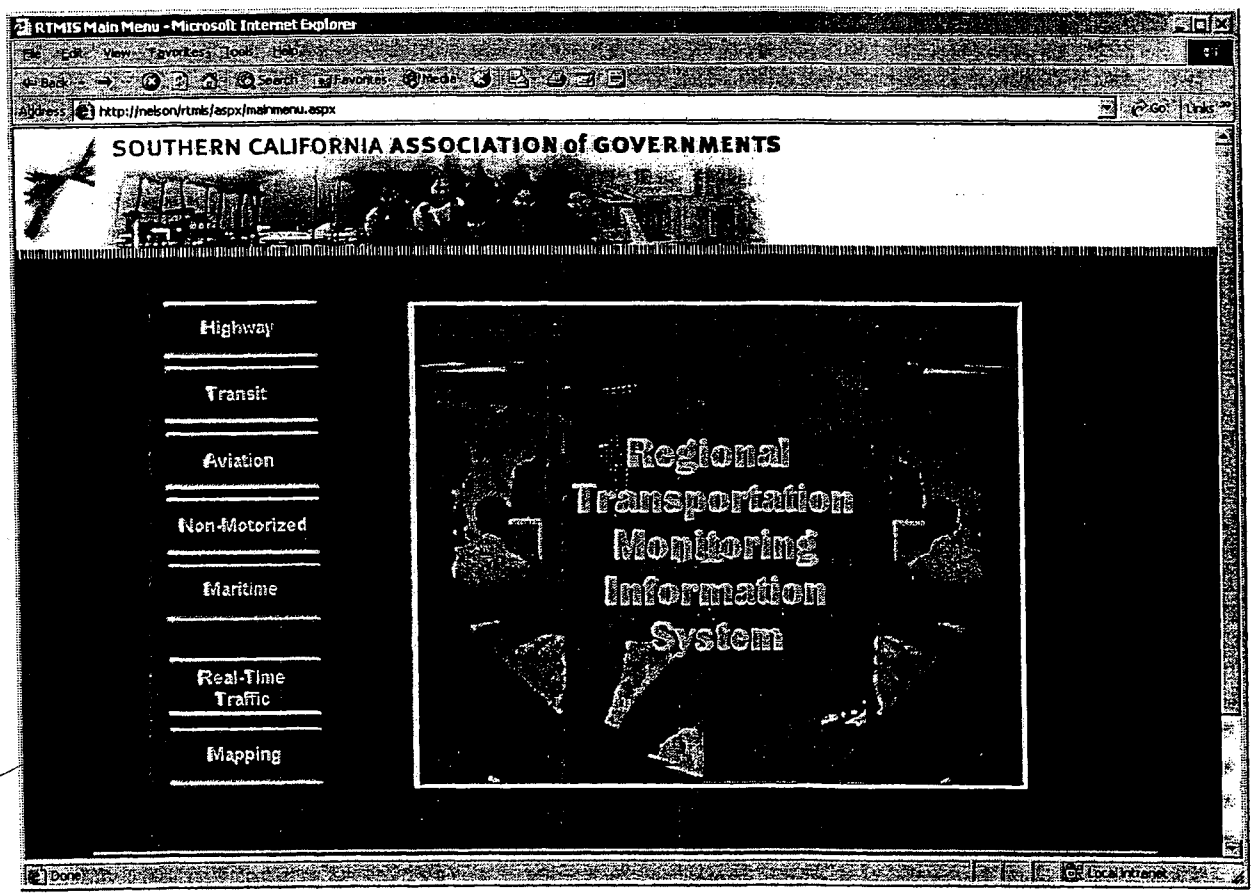
RTMIS provides several links at the bottom of most of its web pages, one of which is named Contact. This link will display a new web browser with contact information for individuals that can address questions, comments, and requests regarding RTMIS.

Once logged in to the application, the RTMIS *Main Page* will be displayed. The M*ain Page* provides users with a main menu of functions available through RTMIS. The following section will discuss the *Main Page* and the main menu items available through the page.

2.3 MAIN MENU

The M*ain Page,* Figure 3 below, is the gateway to RTMIS's web interface functionality; it presents the applications main menu. The menu is organized according to mobility categories and functional modules. Highway, Transit, Aviation, Non-Motorized and Maritime represent the primary mobility categories available in RTMIS and are the first five main menu options. The remaining main menu items are considered functional modules. They are: Real-Time Traffic, and Mapping. The main menu may also contain additional menu items such as a System Administration option depending on the user's classification.

Figure 3. RTMIS Main Page



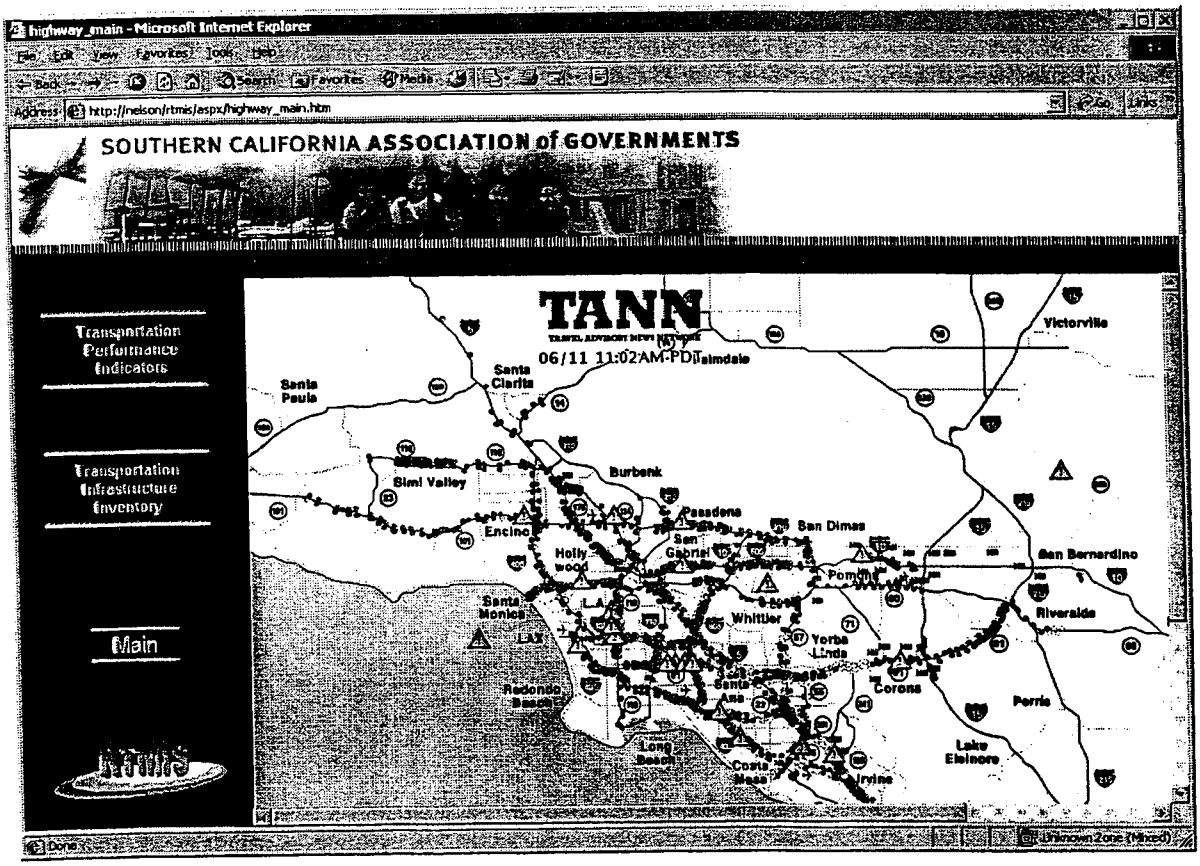
To select a menu option, or RTMIS module, click on the appropriate button on the left side of the *Main Page*. The remainder of this section will present each of the RTMIS modules that are available to all users, including the five mobility categories and 2 functional modules previously introduced.

2.4 MOBILITY CATEGORIES

2.4.1 HIGHWAY

The 'Highway' menu option provides users with access to various highway data to view, edit, query and analyze. When the 'Highway' menu option is selected on the *Main Page*, the *Highway Menu Page* is displayed as shown in Figure 4 below. This page allows the user to currently select either 'Transportation Performance Indicators' or 'Transportation Infrastructure Inventory'.

Figure 4. Highway Menu Page



Selecting the 'Transportation Performance Indicators' option will display the Loop Detector Wizard, which guides users through accessing loop detector data such as average flow or speed while selecting the 'Transportation Infrastructure Inventory' option provides an interface for users to access and edit HMPS data. Each of these options is discussed in detail below.

2.4.1.1 Transportation Performance Indicators

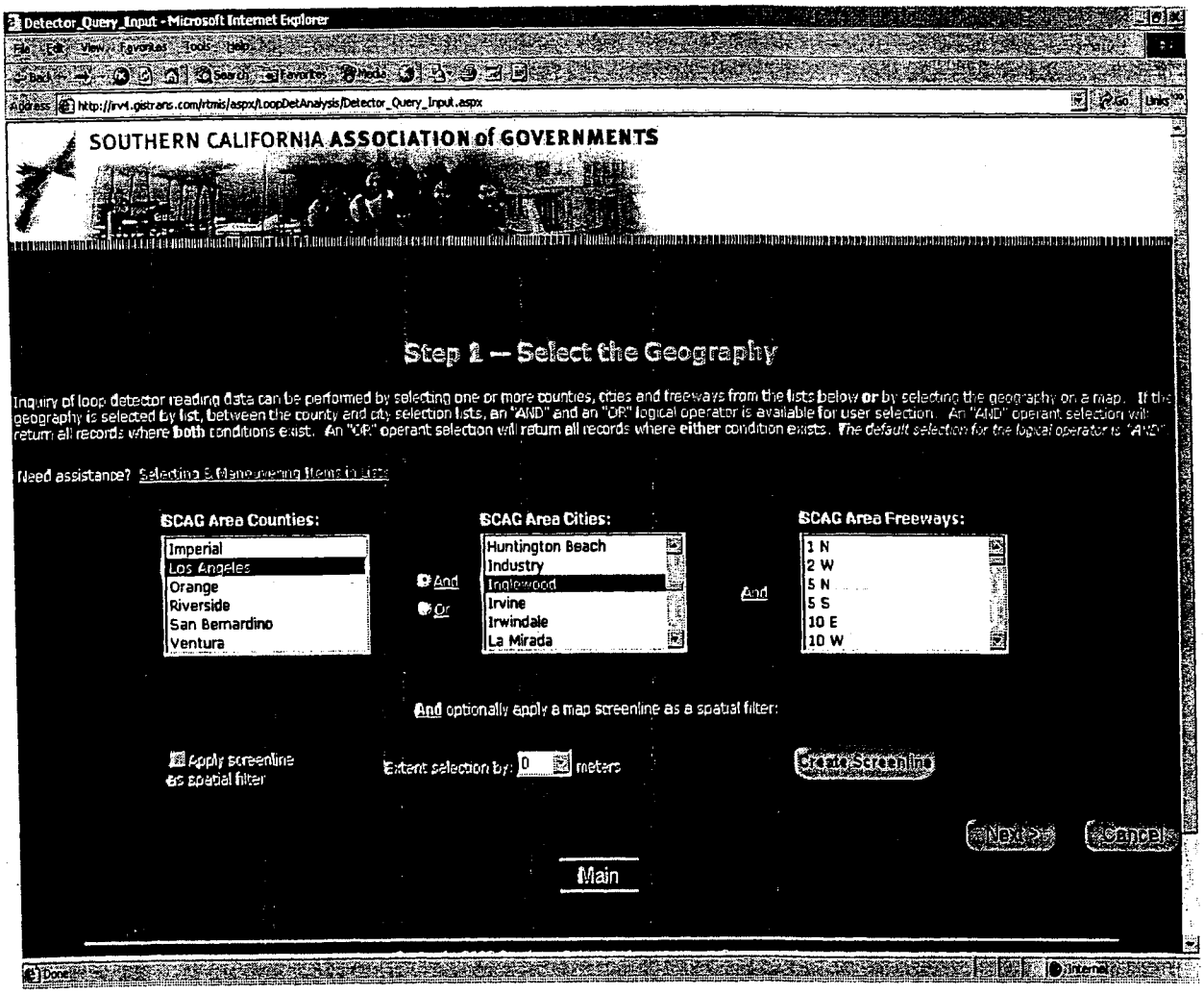
When 'Transportation Performance Indicators' is selected from the *Highway Menu Page*, the Loop Detector Wizard is displayed. The wizard guides users through accessing loop detector data in a series of five steps: selecting a geography, selecting a detector type, selecting a time period, selecting data elements of interest, and selecting an output format.

2.4.1.1.1 The Loop Detector Wizard

Step 1

The first step that the Loop Detector Wizard guides users through is the selection of geography as seen in Figure 5 below. Geography can be defined from a combination of three drop-down lists or by using a screenline, predefined area. Each of these options is discussed below.

Figure 5. Loop Detector Wizard: Select Geography



Selection by Lists

The Loop Detector Wizard presents three drop-down lists in Step 1 from which a user can use to define geography. The first drop-down contains a list of counties that comprise the SCAG region. The second contains a list of all the cities within the SCAG region and the third contains a list of freeways. To define geography, select one or more options from one or more of the lists. If one or more counties is selected as well as one or more cities, specify either the 'AND' option or the 'OR' option by clicking on the appropriate option. When 'AND' is selected only data belonging to both the selected county (ies) and selected city (ies) will be selected while the 'OR' option would select data belonging to either the selected county (ies) or the selected city (ies).

For example, to access loop detector data in Inglewood and Los Angeles county, using the 'AND' operator would return loop detector data for **only** the city of Inglewood within Los Angeles county. This is because the 'AND' option requires both conditions to exist. Using the 'OR' option would return data from **both** Los Angeles county and Inglewood. If the city of Anaheim, which is outside Los Angeles County, was selected instead of Inglewood and the 'Or' option was used all Los Angeles county data and Anaheim data would be selected.

A freeway can also be specified as the defined geography or in combination with county and city. To complete the geography selection step click the 'Next' button on the Loop Detector Wizard to proceed to the next step, Step 2.

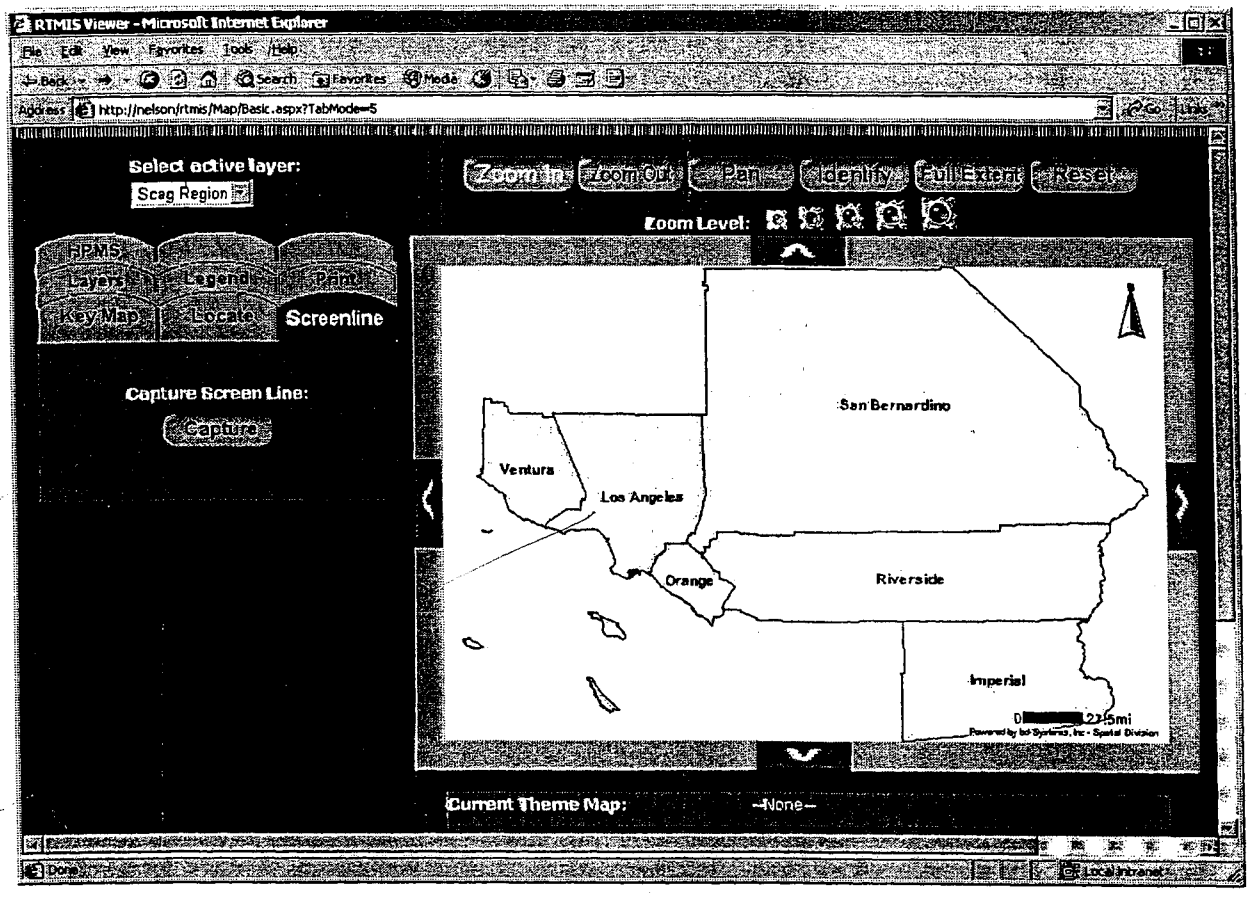
Selection by Screenline

Sometimes there is a need to understand traffic patterns for a particular direction along parallel freeways for example, which would require a specific geography to be defined. The Loop Detector Wizard facilitates this through the use of a screenline. Screenlines provide users with a means to select loop detector locations along or near a freeway. When a screeline is used to define geography, only loop detector data for those segments defined in the screenline will be returned. If a screenline does not currently exist, click the 'Create Screenline' button on the wizard.

Creating a Screenline

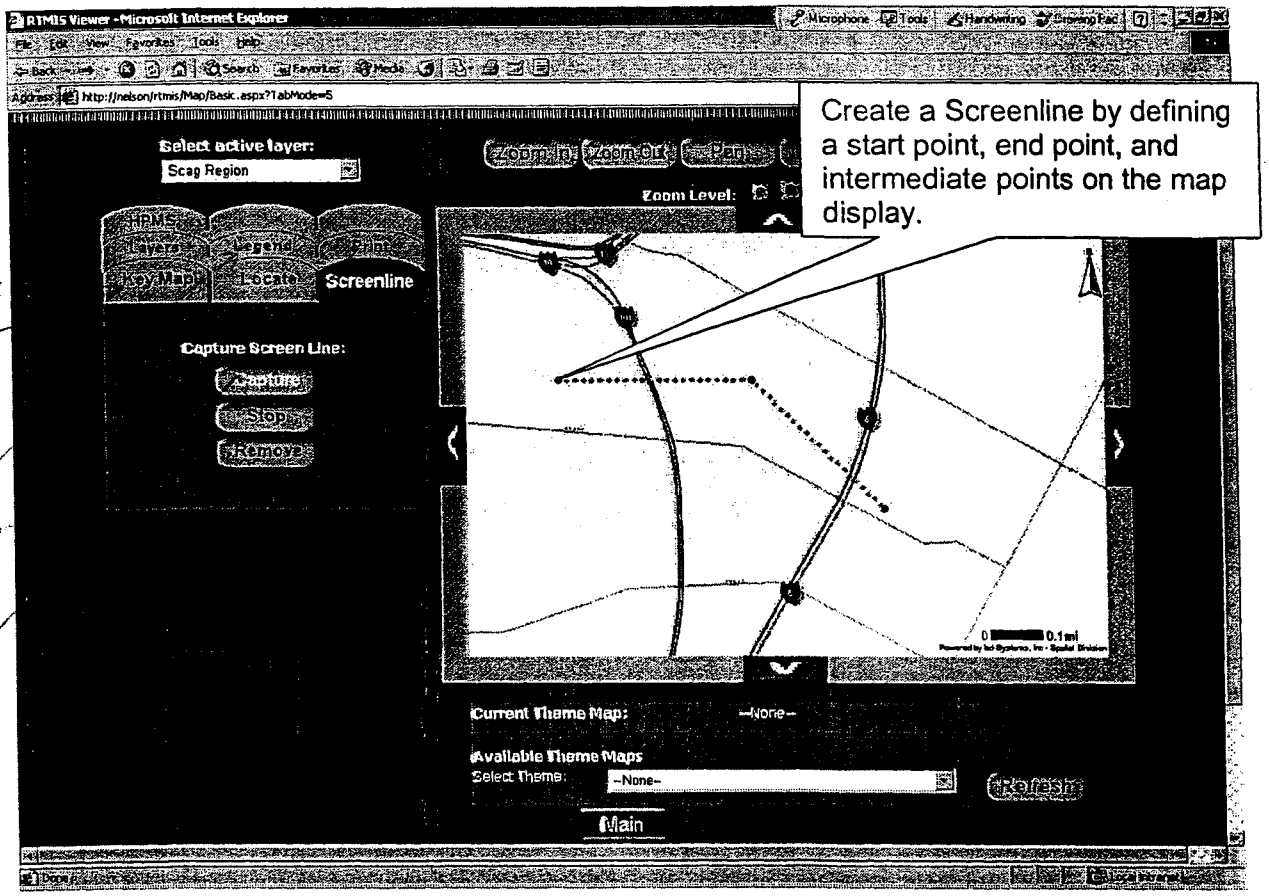
When the 'Create Screenline' button is selected from the Loop Detector Wizard during 'Step1: select geography', the RTMIS mapping interface will be displayed as shown in Figure 6 with the 'Screenline' tab set to active, refer to Section 2.5.2 Mapping for details regarding map functionality.

Figure 6. Creating a Screenline



To define a screenline, navigate to the appropriate zoom level. In addition, it is recommended that the Loop detector segment layer be displayed on the map. Section 2.5.2 provides instructions on setting or changing the zoom level, map navigation functions, and displaying map layers. Next, define the Screenline's starting point on the map by clicking on the display. The screenline can then be extended by clicking on several other points on the map display to create a line that intersects one or more freeways as shown in Figure 7 below. The screenline will display as a dotted line between selected points.

Figure 7. Screenline



Click the 'Stop' button on the Screenline Tab to save the screenline. The screenline will be stored for the duration of your session, until you exit the application or the application times out. Application timeouts occur when the browser window sits idle for a period of time, when a user is not interacting with the application but has not closed the browser window. ONLY ONE SCREENLINE can be stored per session.

To use a newly created screenline, you must return to the Loop Detector Wizard. The 'Main' link located at the bottom of the mapping interface will display the *Main Page* from which users can access the 'Highway' option and then the 'Transportation Performance Indicators' option from the *Highway Menu Page*.

When a screenline exists, the apply screenline checkbox located at the bottom of the page on Step1 is enabled. To use the newly created screenline, click on the checkbox to apply the screenline as a filter. When a screenline is being applied, an extent may also be specified. To specify an extent distance, select a distance option from the extent drop-down list. When an extent distance is specified, a buffer of the selected distance is constructed around selected segments. Loop detectors located on highway segments that fall within this buffer will be used as the defined geography. Users my click on the 'See Map' button to view the screenline,

buffer area, and selected segments. To complete the geography selection step click the 'Next' button on the Loop Detector Wizard to proceed to the next step.

Step 2

Step 2 of the Loop Detector Wizard defines the type of detector to return data for. Users can select between Mainline and HOV lanes, Mainline lanes only, or HOV lanes only. By default Mainline and HOV lanes is selected. Once a detector type has been specified click the 'Next' button to proceed.

Step 3

Step 3 of the Loop Detector Wizard defines a time period of interest. Loop detector data can be returned for a single time period or two time periods can be specified for comparison.

Single time periods are defined with a single start and end date. For example a single time period, Figure 8 below, would be defined by all loop detector data within the first and the tenth of a particular month. When two time periods are compared, Figure 9 below, a start and end date for each time period is defined. For example, data for the current month can be contrasted with data during the same time last year.

To define start and end dates, enter the data using any of the following formats:

- MM/DD/YY
- MM-DD-YY
- MM.DD.YY

In addition to specifying a date range, specific hours such as the morning peak hours can be defined to refine a time period(s). For example a time period can be defined with a start date of 01/01/03 and an end date of 1/05/03 between the hours of 6:00Am and 8:59Am.

Figure 8. Defining a Single Time Period

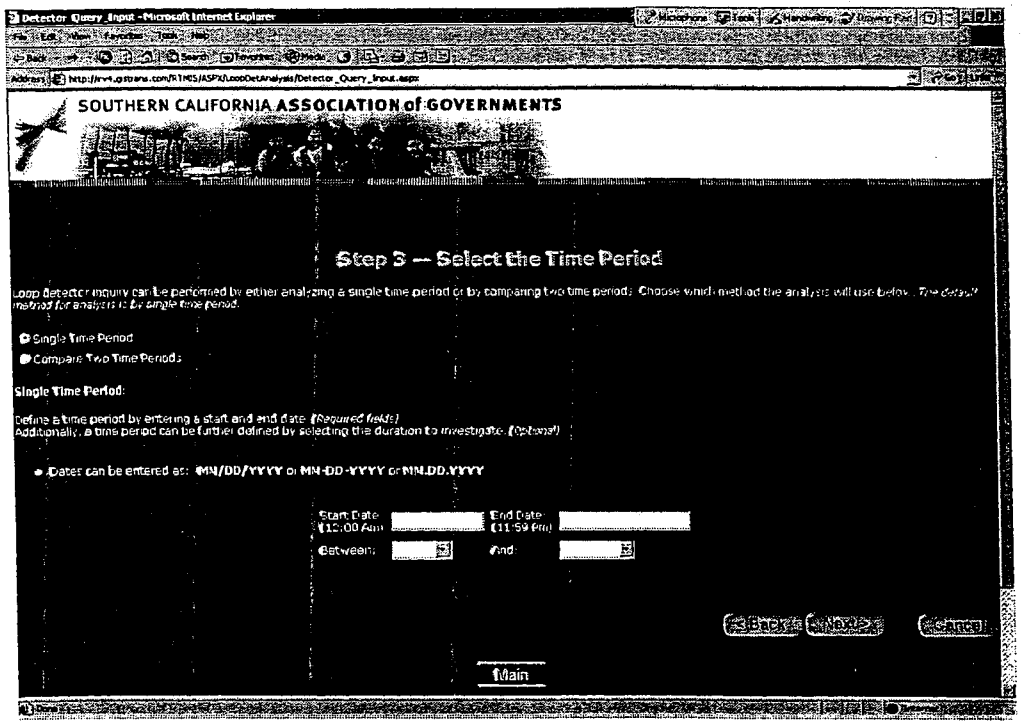
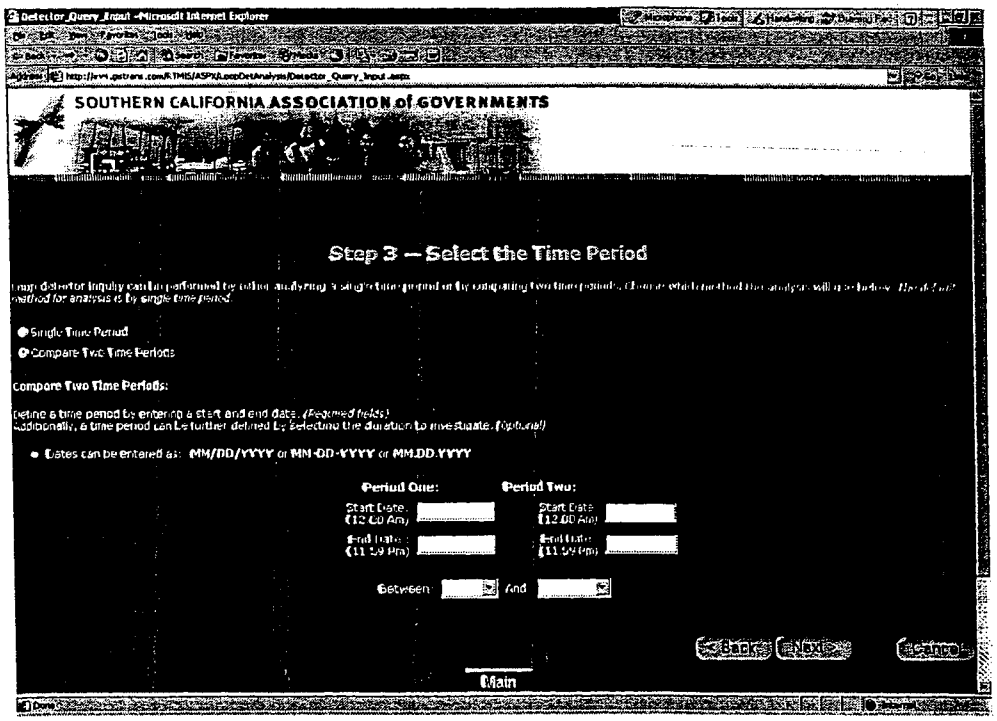


Figure 9. Comparing Two Time Periods

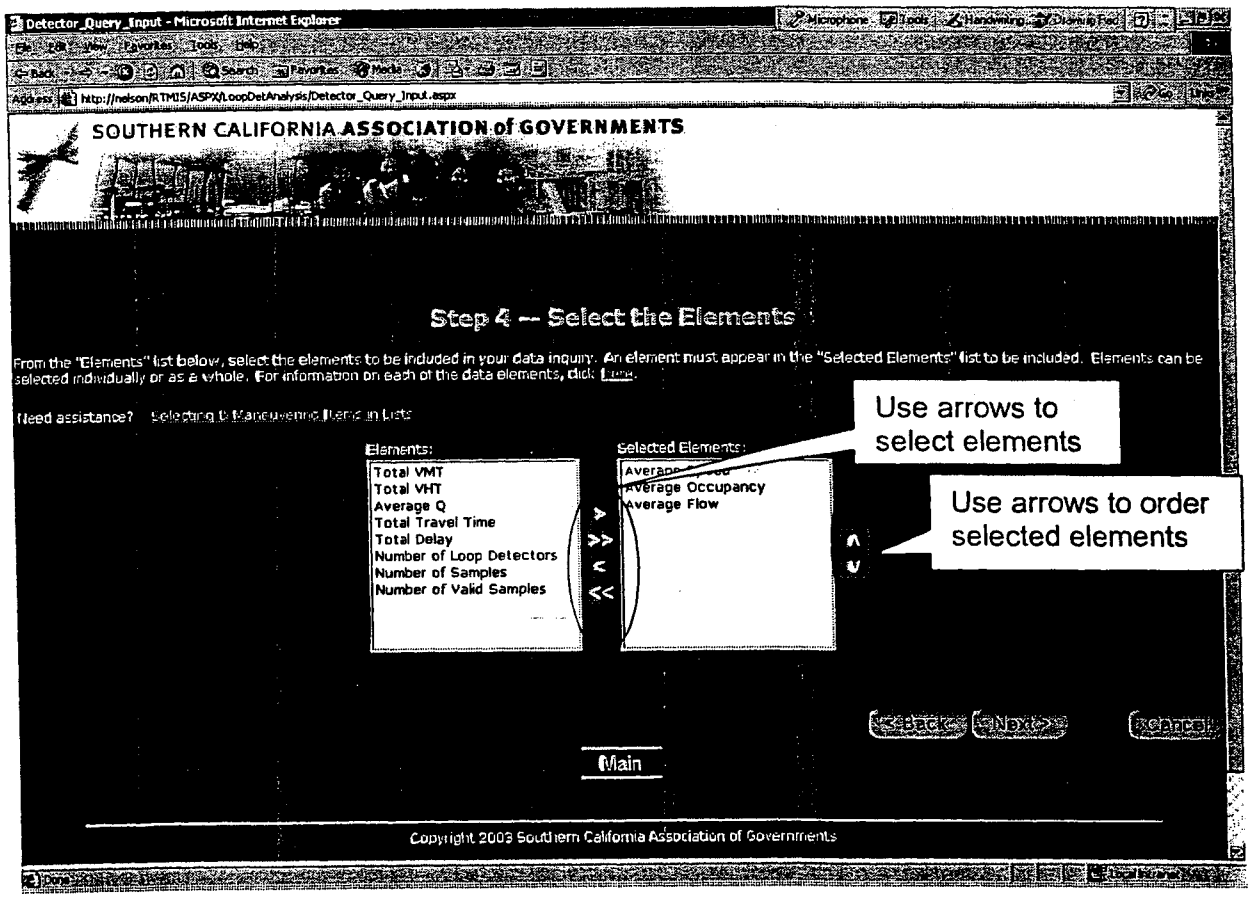


Once either a single time period or a time period comparison has been specified, click the 'Next' button to proceed.

Step 4

During step 4, the Loop Detector Wizard guides users through selecting one or more data elements of interest as shown in Figure 10 below. To select an element, click on the item from the list of options on the left and then click the forward arrow button to move the item to the 'Selected Element' display box on the right.

Figure 10. Selecting Loop Detector Data Elements



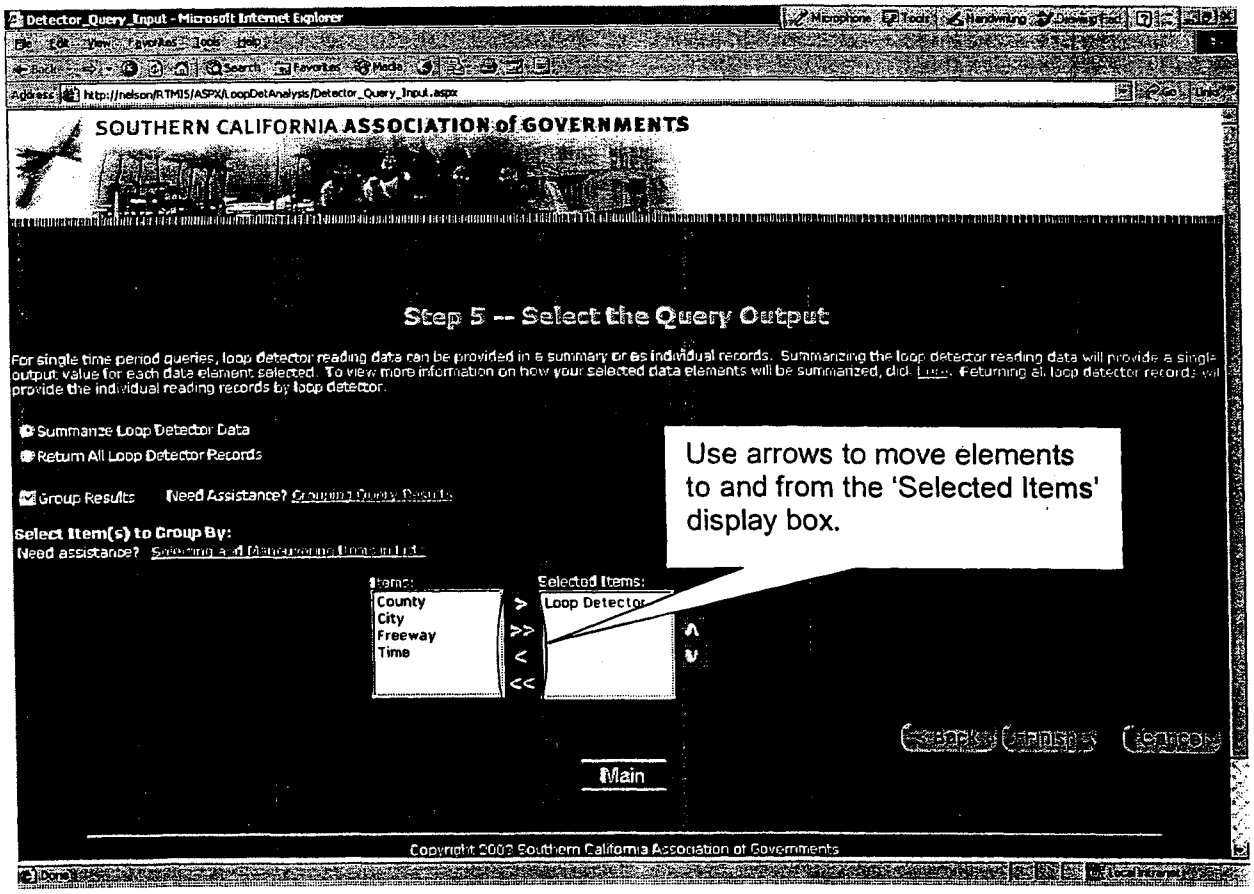
Multiple items can be selected or unselected from the list on the right by using the 'Shift' and 'Ctrl' keys. The back arrow button can be used to remove a selected data element by clicking on the element in the 'Selected Elements' display box on the right and then clicking the back arrow button. In addition, you can remove all selected elements by using the double back arrow button, <<. Similarly you can select all data elements from the left by clicking the double forward arrow button, >>. The order of the selected data elements can be adjusted by clicking on a selected element from the 'Selected Elements' display box on the right and clicking either the up or down arrow button to move the item accordingly.

Once the desired data elements have been selected, click on the 'Next' button to proceed to the final step of the Loop Detector Wizard.

Step 5

The final step of the Loop Detector Wizard guides users through defining an output format. Loop detector data can be grouped by clicking on the 'Group Results' check box as shown in Figure 11. One or more of the following items can group Loop detector data: County, City, Freeway and Time.

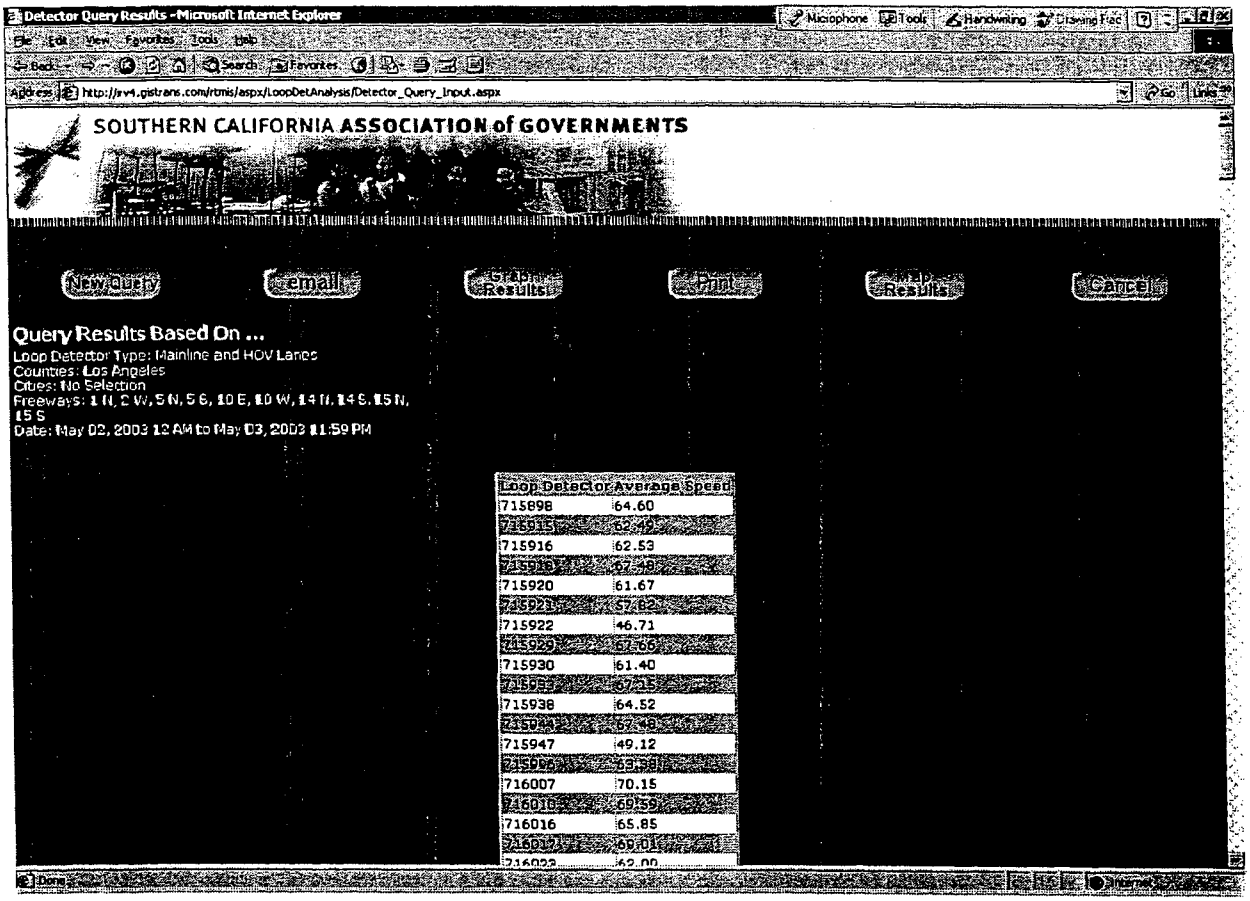
Figure 11. Selecting output format



To select a group by item, click on the item form the list on the left and then click on the forward arrow button to move the item to the 'Selected Items' display box on the right. As discussed in Step 4, data element selection, items can be maneuvered through the use of the 'Shift' and 'Ctrl' keys along with the various arrow buttons provided by the wizard.

Once the output format has been defined through group by items, click the 'Finish' button to view the results. The results will be displayed in a table similar to the one shown in Figure 12 below.

Figure 12. Loop Detector Results

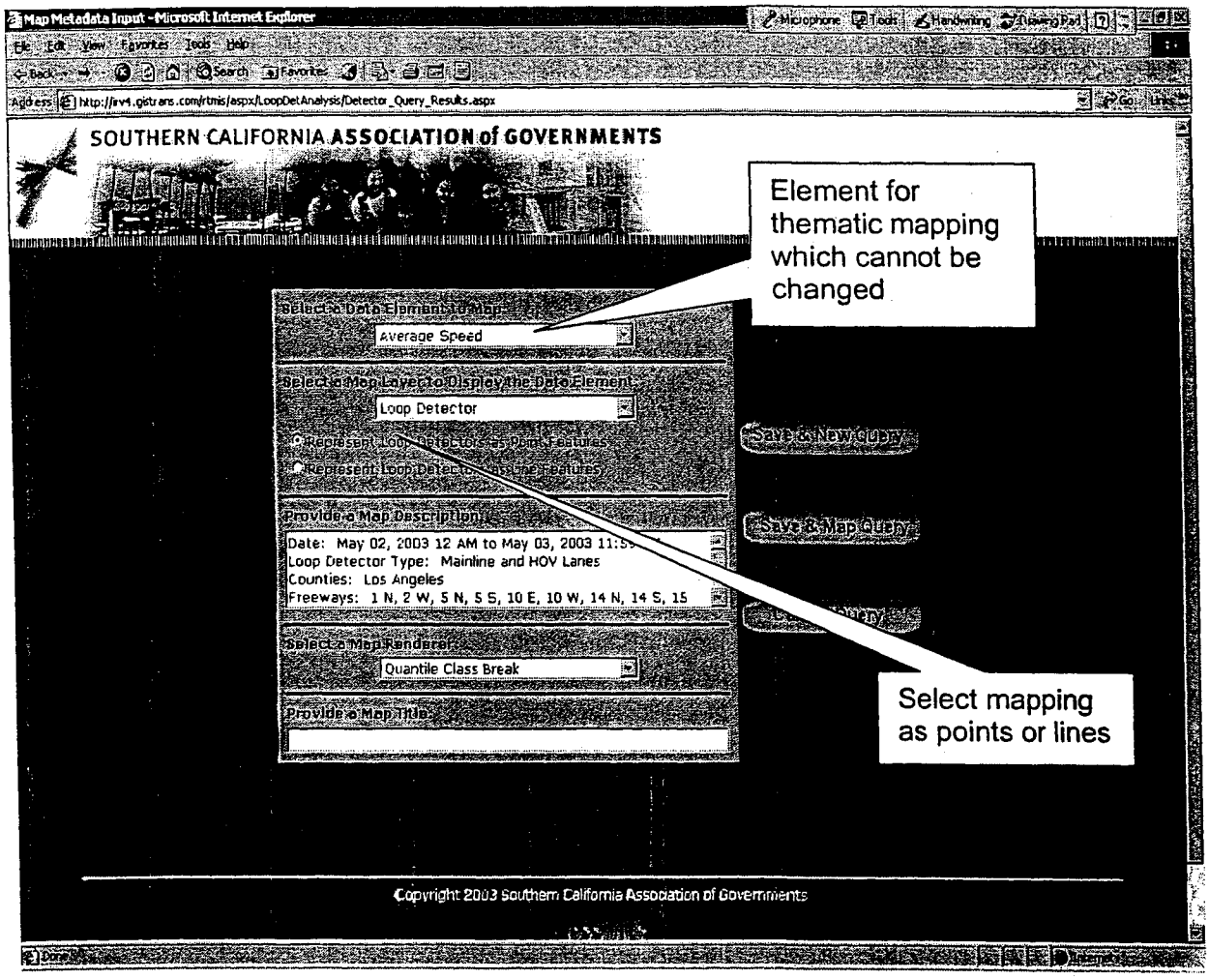


A number of options may be available on the result page, as shown in Figure 12 above. Depending on the selections made through the Loop Detector Wizard, not all of the options seen above will be available. For example, loop detector data can be mapped only in certain instances. When loop detectors are selected as the only group by item during the final step of the wizard, the mapping option will be available.

Mapping Loop Detector Results

If 'Map Results' is selected from the *Loop Detector Results Page*, a thematic *Map Descriptor Page* will be displayed as shown in Figure 13. The *Map Descriptor Page* is used to prepare the loop detector results for mapping.

Figure13. Thematic Map Descriptor Page



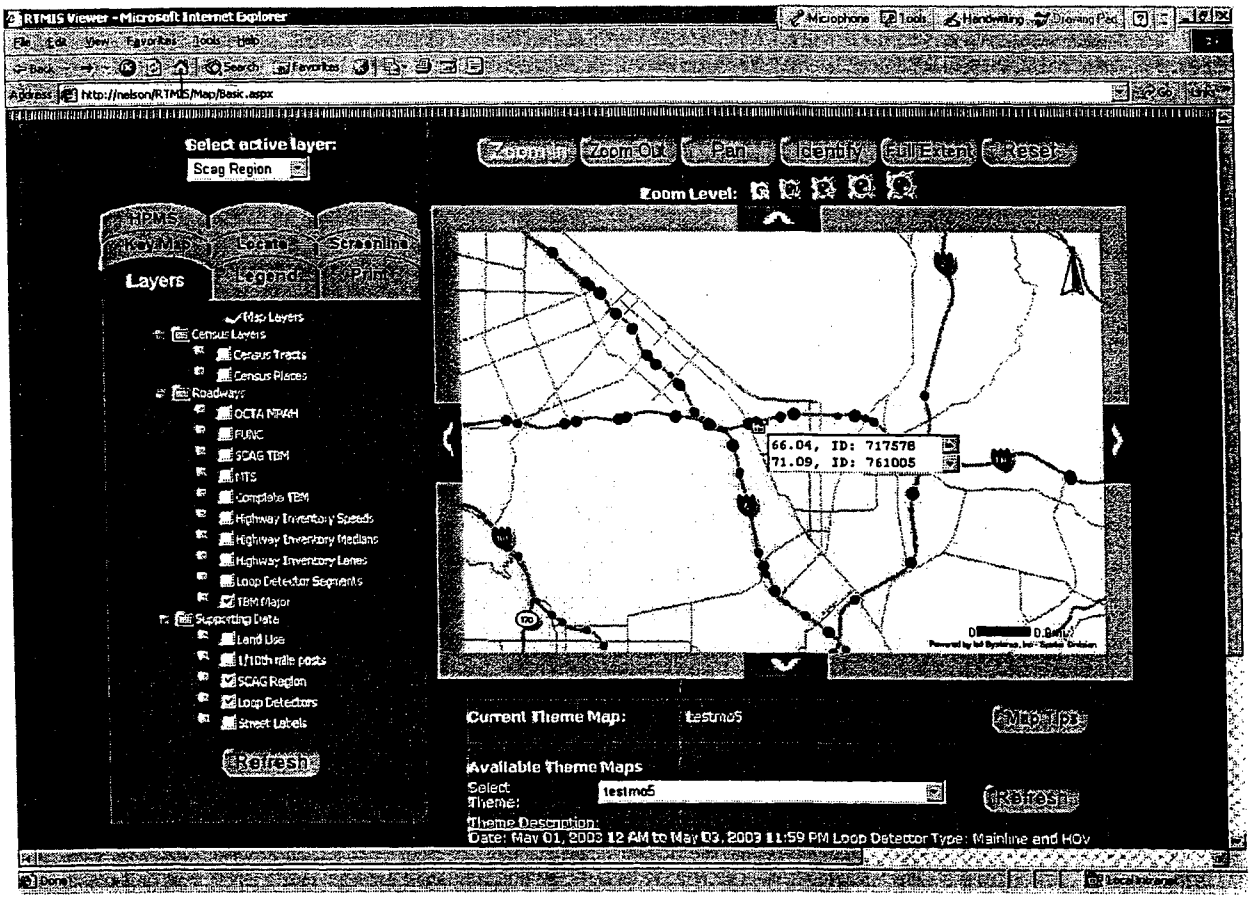
The *Map Descriptor Page* allows users to enter a map title, specify how loop detectors are displayed, modify the default description of the current map results, and select a map render.

Data can be mapped using either a Quantile Class Breaks or Equal Interval Breaks renderer. The Quantile Class renderer, uses attribute ranges are broken down into classes such that each class contains an equal number of features, while the Equal Interval renderer uses attribute ranges broken down into equal size intervals. In addition, the user can specify how data elements such as average speed grouped by loop detectors can be represented. Either lines or points may be used to map the results. Once the thematic mapping parameters have been defined, including a map title, users can chose to save and begin a new query using the Loop Detector Wizard or save and map the current results. Each map must have a unique title.

Clicking 'Save & New Query' button will save the current thematic map or generate a new query by using the Loop Detector Wizard again, while clicking the 'Save and Map Query'

button will produce a map such as the one shown in Figure 14 below. Loop detector locations with average speeds rendered as graduated symbols can be seen in the figure.

Figure14. Mapping Loop Detector Results

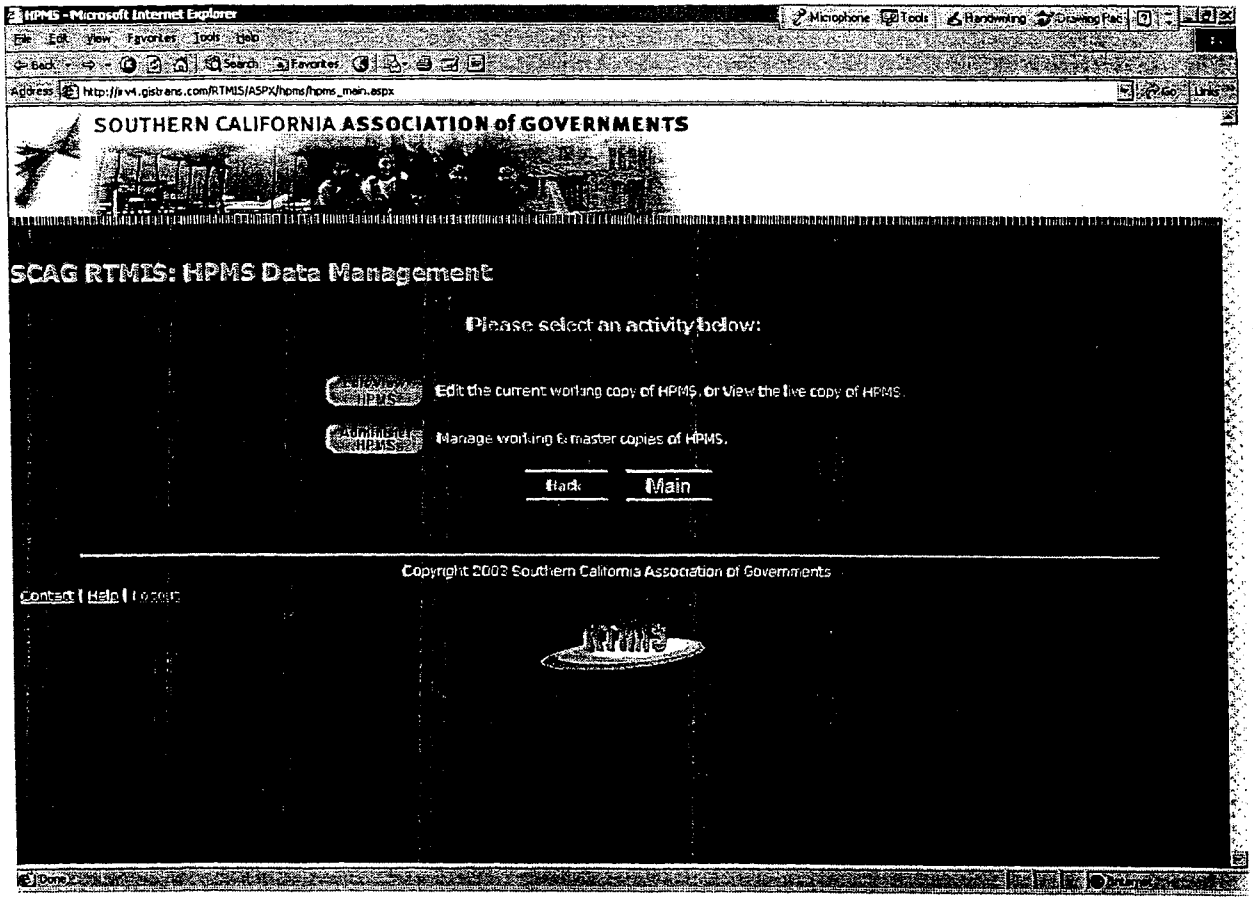


As shown in Figure 15 above, the mapping interface contains a Thematic Mapping section, which displays the current thematic map title and the descriptions of each thematic map generated during the session, and provides access to Map Tips. The current session will end when the browser window is closed or when the application times out. Application timeouts occur when the application sits idle for a period of time, but the browser window remains open or minimized. Refer to Section 2.5.2 Mapping for more detail about the Thematic Mapping section and Map Tips.

2.4.1.2 Transportation Infrastructure Inventory

The 'Transportation Infrastructure Inventory' option on the *Highway Menu Page* provides users with access to HPMS data. When this option is selected from the *Highway Menu Page*, the *HPMS Menu Page* seen in Figure 15 is displayed.

Figure 15. HPMS Menu Page

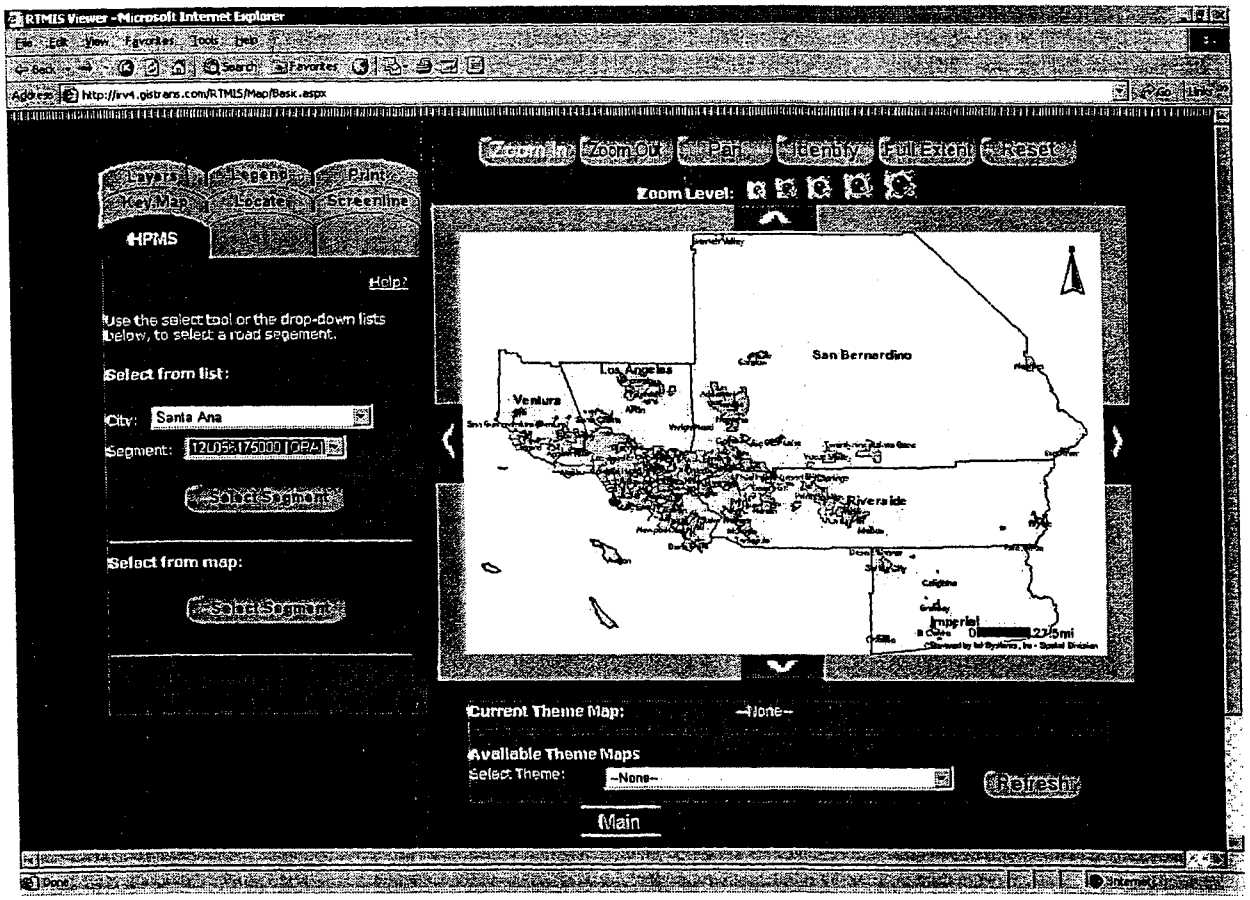


The first option, 'Edit/View HPMS' allows users to edit or view HPMS data. All users may access and view HPMS through RTMIS, however HPMS data editing is a limited or restricted function. Only certain users with specific roles and privileges may edit HPMS data online.

2.4.1.2.1 Viewing & Editing HPMS data

To view HPMS data, select the 'Edit/view HPMS' option from the *HMPS Menu Page*. The HPMS mapping interface will then display, Figure 16, with the HPMS Tab active. To view HPMS data, a road segment must be selected either by selecting from the drop-down lists or interactively from the map display.

Figure16. Viewing HPMS Data



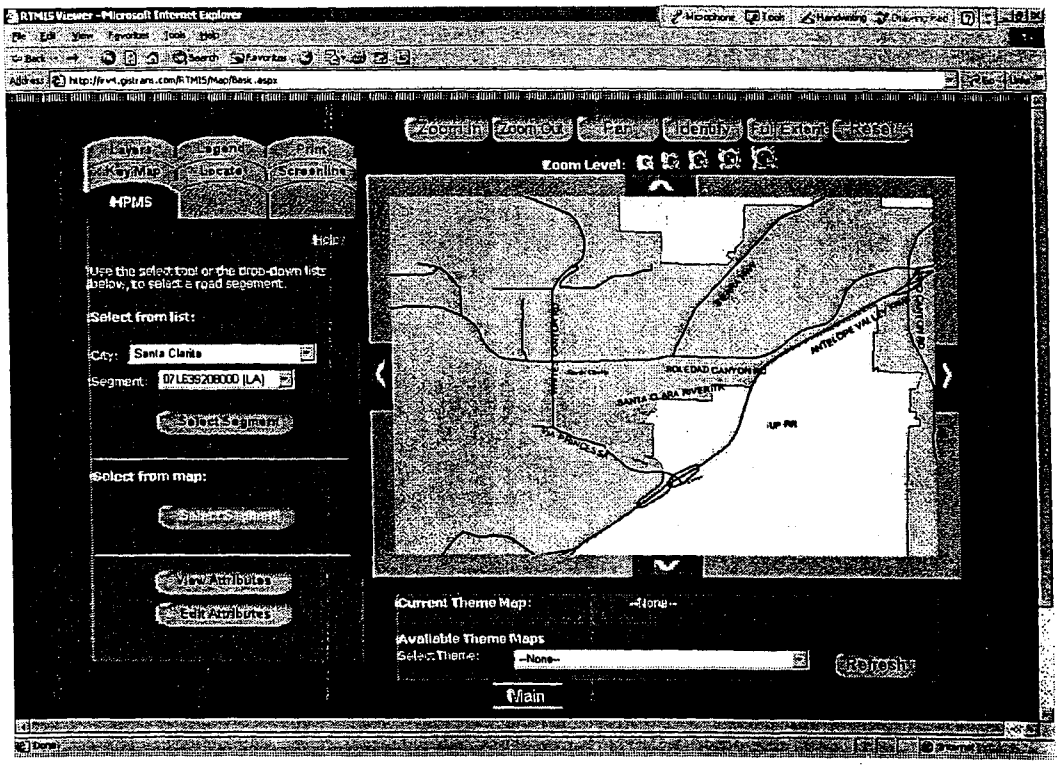
Selecting from List

The HPMS Tab contains two drop-down list boxes; the first contains a list of cities. When a city is selected from the list the second drop-down list is populated with a listing of segments within the specified city. Each of these segments can be examined, and their HPMS data viewed by clicking the 'Select Segment' button. Once a segment has been selected the view option will become available as seen in Figure 17 below. Instead of selecting a segment from the drop-down lists, one may be selected from the map as detailed below.

Interactive Map Selection

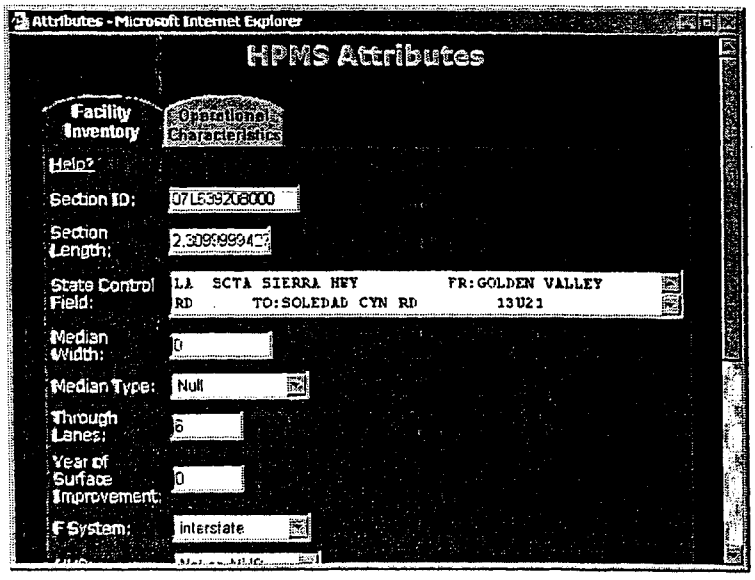
A road segment can be select interactively from the map display instead of choosing one from the drop-down lists. To select a segment from the map display zoom to an area of interest And click the 'Select Segment' button located in the 'Select from map' section of the HPMS Tab. Next, click on a segment on the map display. Once a segment has been selected, the view option will become available as seen in Figure 17 below.

Figure17. View the selected segment for HPMS editing



The HPMS attributes for the selected segment can be examined (read-only) by clicking on the 'View Attributes' button on the HMPS Tab. The 'View Attributes' button will open a new browser window displaying an attribute form for the currently selected segment, Figure 18.

Figure18. HPMS Attributes Window



HPMS attributes are classified into two categories: 'Facility Inventory' attributes or 'Operational Characteristics'. The 'Facility Inventory' tab is selected by default. Click on the 'Operational Characteristics' tab to examine additional HPMS attributes such as 'AADT', 'DIR Factor'.

Editing HPMS data

Only certain users with specific roles and privileges may edit HPMS data online. To edit HPMS data a road segment must be selected either by selecting from the drop-down lists or interactively from the map display.

Selecting from List

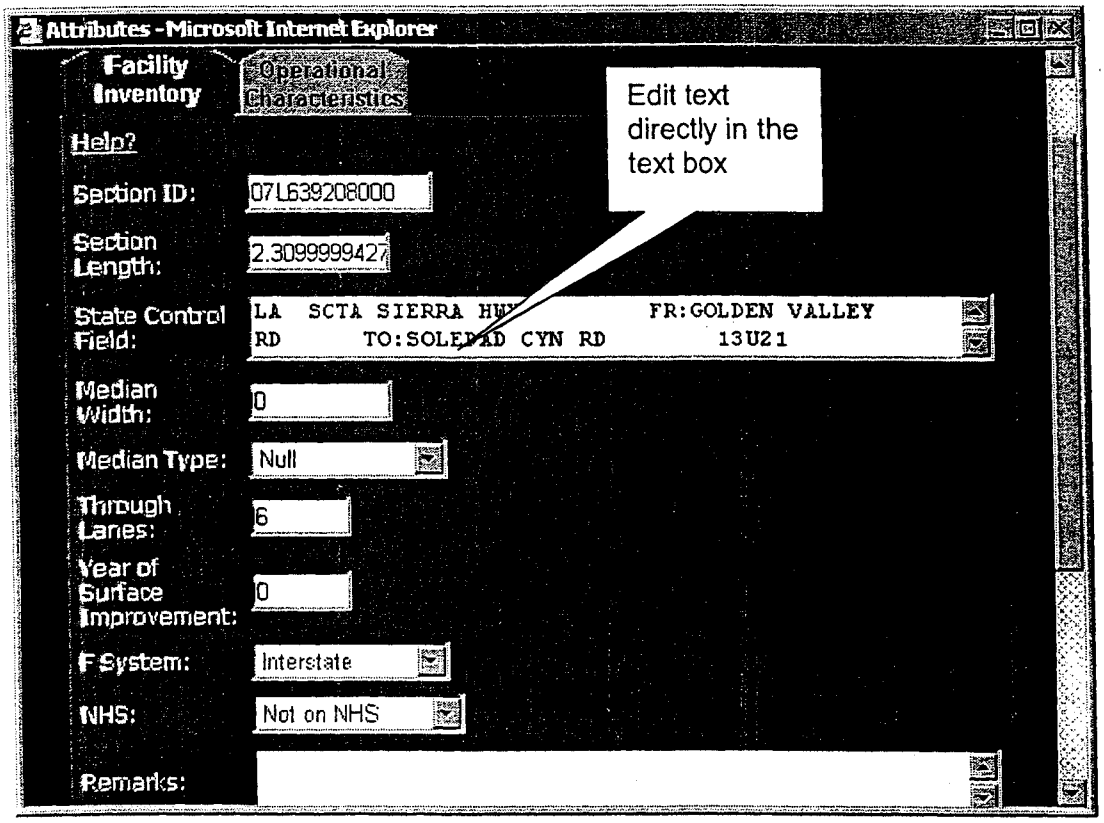
The HPMS Tab contains two drop-down list boxes; the first contains a list of cities. When a city is selected from the list the second drop-down list is populated with a listing of segments within the specified city. Each of these segments can be examined, and their HPMS data viewed by clicking the 'Select Segment' button. Once a segment has been selected, the edit option will become available as seen in Figure 17 above. Instead of selecting a segment from the drop-down lists, one may be selected from the map as detailed below.

Interactive Map Selection

A road segment can be select interactively from the map display instead of choosing one from the drop-down lists. To select a segment from the map display zoom to an area of interest And click the 'Select Segment' button located in the 'Select from map' section of the HPMS Tab. Next, click on a segment on the map display. Once a segment has been selected, the edit option will become available as seen in Figure 17 above.

Clicking on 'Edit Attributes' button on the HPMS Tab opens a new browser window as shown in Figure 19, displaying an attribute form for the currently selected segment. Attributes on the form can be edited. To update an attribute, click on a field and editing the text.

Figure 19. Editing HPMS Data

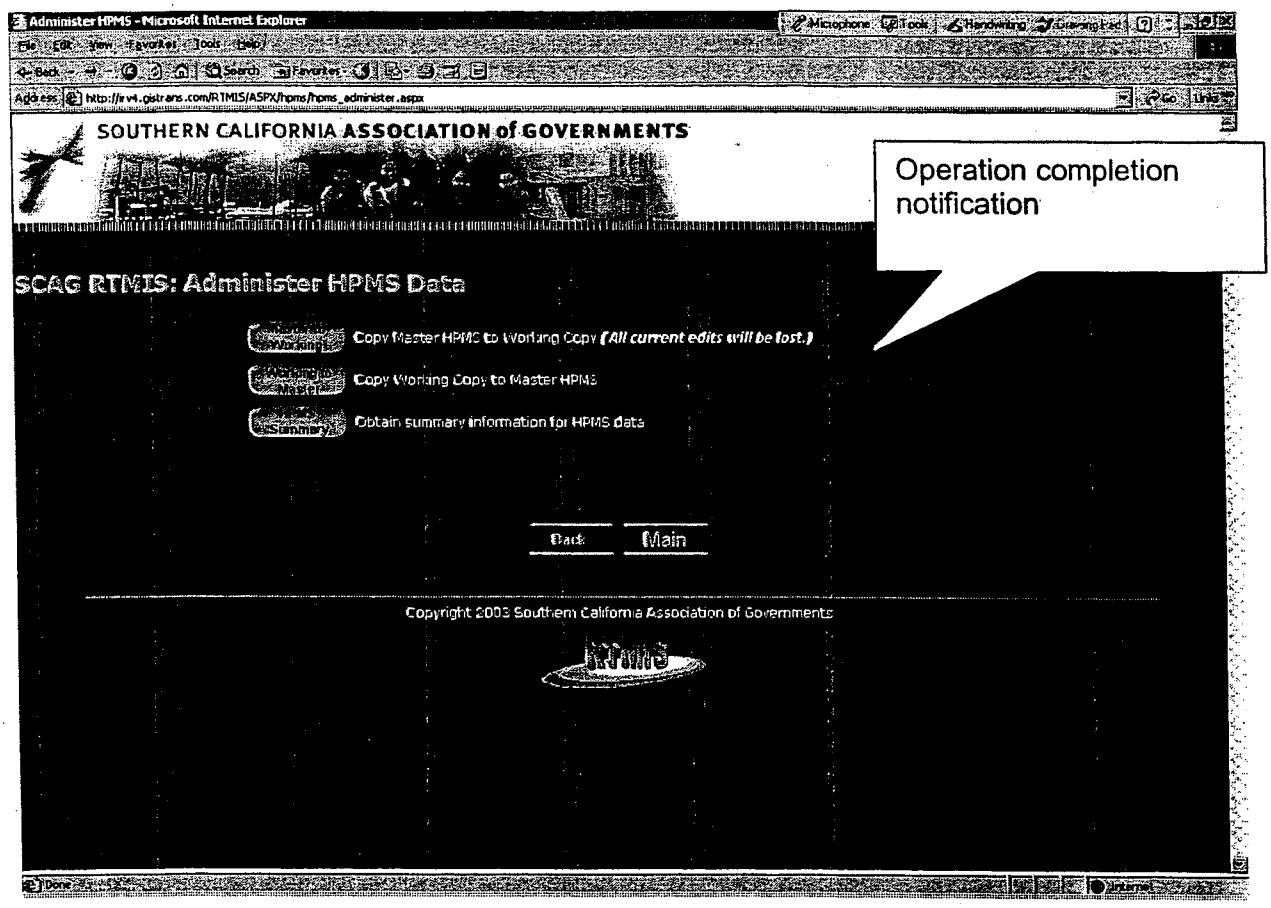


Once all edits have been completed, click the update at the bottom of the attribute form to save the changes. RTMIS maintains multiple datasets representing the HPMS data, as a result the edits made will not be seen when the segment's attributes are viewed until the edits have been reviewed and accepted through the HPMS data administration functions.

2.4.1.2.2 Administering HPMS Data

HPMS data administration is a limited or restricted function that requires the appropriate user role or classification level. Users can accesses HPMS data administration by clicking the 'Administer HPMS' button on the *HPMS Menu Page*. The page seen in Figure 20 below, displays the HPMS data administration options.

Figure 20. Administrator HPMS Data Window



When users make edits online to the HPMS data, only the working copy is changed. These edits should be reviewed before being accepted. To accept the edits select the second option shown in Figure 20 above, 'Working to Master'. Clicking this button will copy all edits recently made to the HPMS data to the master copy and archive the current master copy.

'Master to Working'. Clicking this button will copy the current master copy data into the working copy thus removing all the working copy edits recently made.

The 'Working to Master' button on the other hand does the reverse of this. This option will copy all edits recently made to the HPMS data to the master copy. Thus, edits will be made permanent. After each of the operations above is completed, an 'Operations Completed' notification will appear in red alongside the menu button.

Working copies of the HPMS can be edited or viewed. The second option lets the user manage working and master copies of the HPMS.

Finally the 'HPMS Summary' button will obtain a summary listing of data transfers and edits made during the session with corresponding record sizes, dates and times.

2.4.2 TRANSIT, AVIATION, NON MOTORIZED AND MARITIME

The remaining mobility categories presented below are modules scheduled for future completion. These items are available through the main menu accessible from the *Main Page*. These links may be accessed and will currently display an under construction message and a list of related links where available, providing a resource center until the mobility module is completed.

Transit

The 'Transit' module is accessed from the main page by clicking the 'Transit' option from the main menu. This module is scheduled to be a future addition to RTMIS.

Aviation

The 'Aviation' module is accessed from the main page by clicking the 'Aviation' option from the main menu. This module is scheduled to be a future addition to RTMIS.

Non-Motorized

The 'Non-Motorized' module is accessed from the main page by clicking the 'Non-Motorized' option from the main menu. This module is scheduled to be a future addition to RTMIS.

Maritime

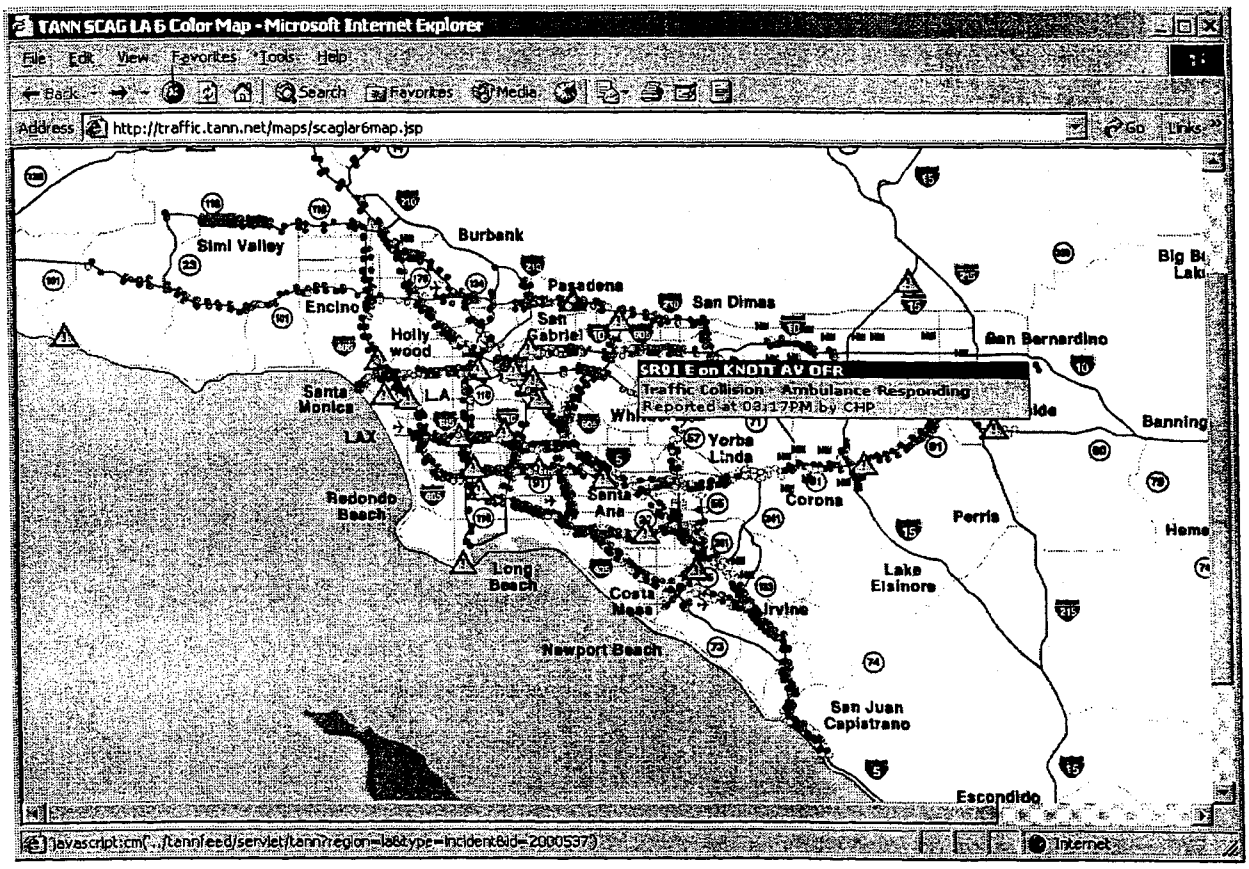
The 'Maritime' module is accessed from the main page by clicking the 'Maritime' option from the main menu. This module is scheduled to be a future addition to RTMIS.

2.5 FUNCTIONAL MODULES

2.5.1 REAL-TIME TRAFFIC

The Real-Time Traffic option from the main menu presents the user with real-time traffic information for the SCAG region. Selecting Real-Time Traffic from the main menu will launch a new web browser window displaying an interactive map display provided by the Travel Advisory News Network, TANN as shown in Figure 21.

Figure 21. Travel Advisory News Network page

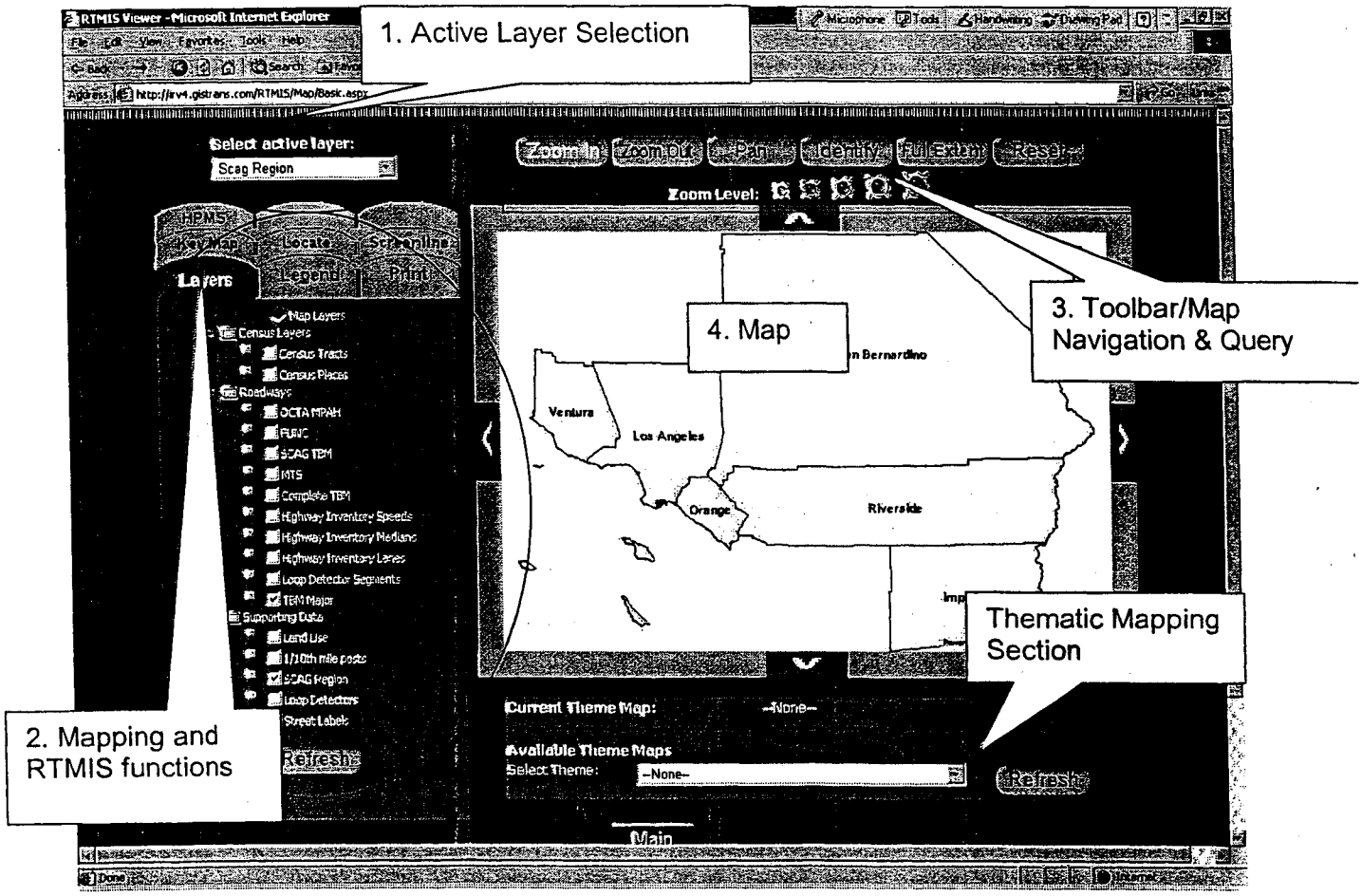


Traffic congestion information such as speeds at street and freeway intersections along with traffic collision locations can be obtained from the map display. As shown in Figure 22 above, when the mouse is placed over a location of interest, traffic information is shown near the location on the map display. For example, Figure 21 shows information about a traffic collision that has occurred on the highway. The reported time of the accident and current status can be viewed. Similarly, conditions such as average speeds at intersections can be obtained by using the mouse to interact with the map display.

2.5.2 MAPPING

This section will introduce the mapping functionalities and RTMIS's map interface. The mapping functions can be launched by clicking the 'Mapping' option on the RTMIS *Main Page*. Upon clicking this option, the main mapping page shown in Figure 22 is presented to the user. The map interface is organized into several sections, which have been numbered on the figure each of which will be described in greater detail below after the default map interface is summarized.

Figure 22. Mapping Functions Page



By default the 'layers' tab is turned on in the Mapping and RTMIS functions section of the map interface. SCAG Region and TBM layers are the layers displayed by default on the initial map. The default map displays the entire SCAG region as shown above in Figure 22.

The mapping module has five main areas as mentioned previously. They are the Active Layer Selection, Mapping and RTMIS functions section, the Toolbar/Map Navigation & Query section, the Map display section and the Thematic Map section. Each of these areas and included functions are presented below.

2.5.2.1 Active Layer Selection

The active layer section allows users to select an active map layer. Several mapping tools such as the Identify tool will return results based on which map layer is active. To select an active layer, click the drop-down arrow on the control to view the list of layers, which are currently available and click on a particular layer. Only those layers turned on and shown on

the map display will be available in the list. While a layer may be turned on, the map display may not be at an appropriate scale to display one or more layers, as a result these layers will not become available in the active layer list. For further information about displaying map layers refer to Section 2.5.2.2 below. Directly beneath the active layer section is the mapping and RTMIS function section, which will be discussed next.

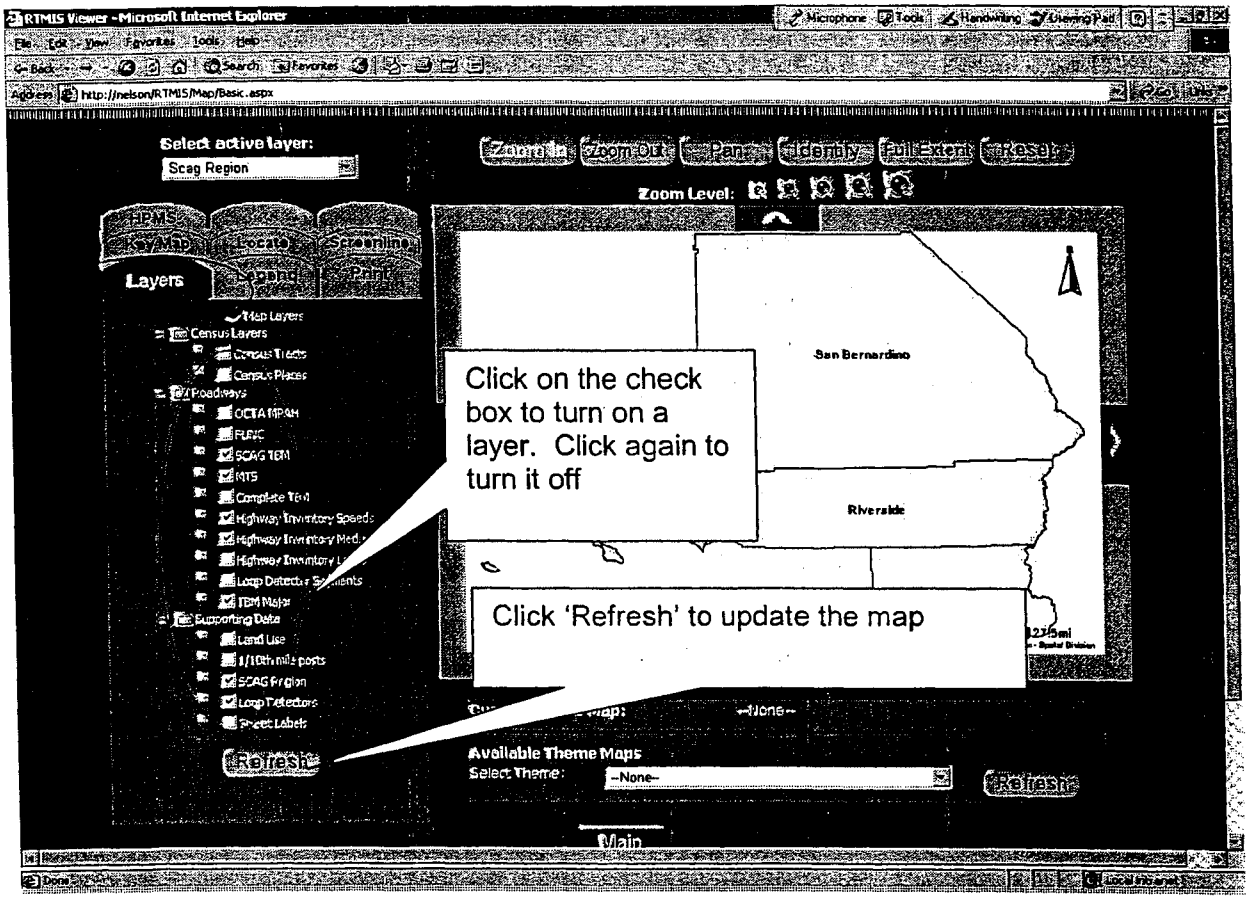
2.5.2.2 Mapping and RTMIS functions

This area on the map interface is identified as a panel of tabs located on the left of the map. Each tab represents either a mapping function or function specific to RTMIS. The remainder of the section will present each tab and associated functions.

Layers tab

The layers tab, shown in Figure 23 below, allows the user to modify the map display by turning map layers on and off. This can be done by clicking on the checkbox next to the appropriate layer. This action will either display a check mark if the layer was previously turned off, or remove the existing check mark if the layer is turned on. The layers that are turned on, as indicated with checkmarks, will be displayed on the map once the map display is updated by clicking the 'Refresh' button located at the bottom of the Layer Tab.

Figure 23. Layers Tab



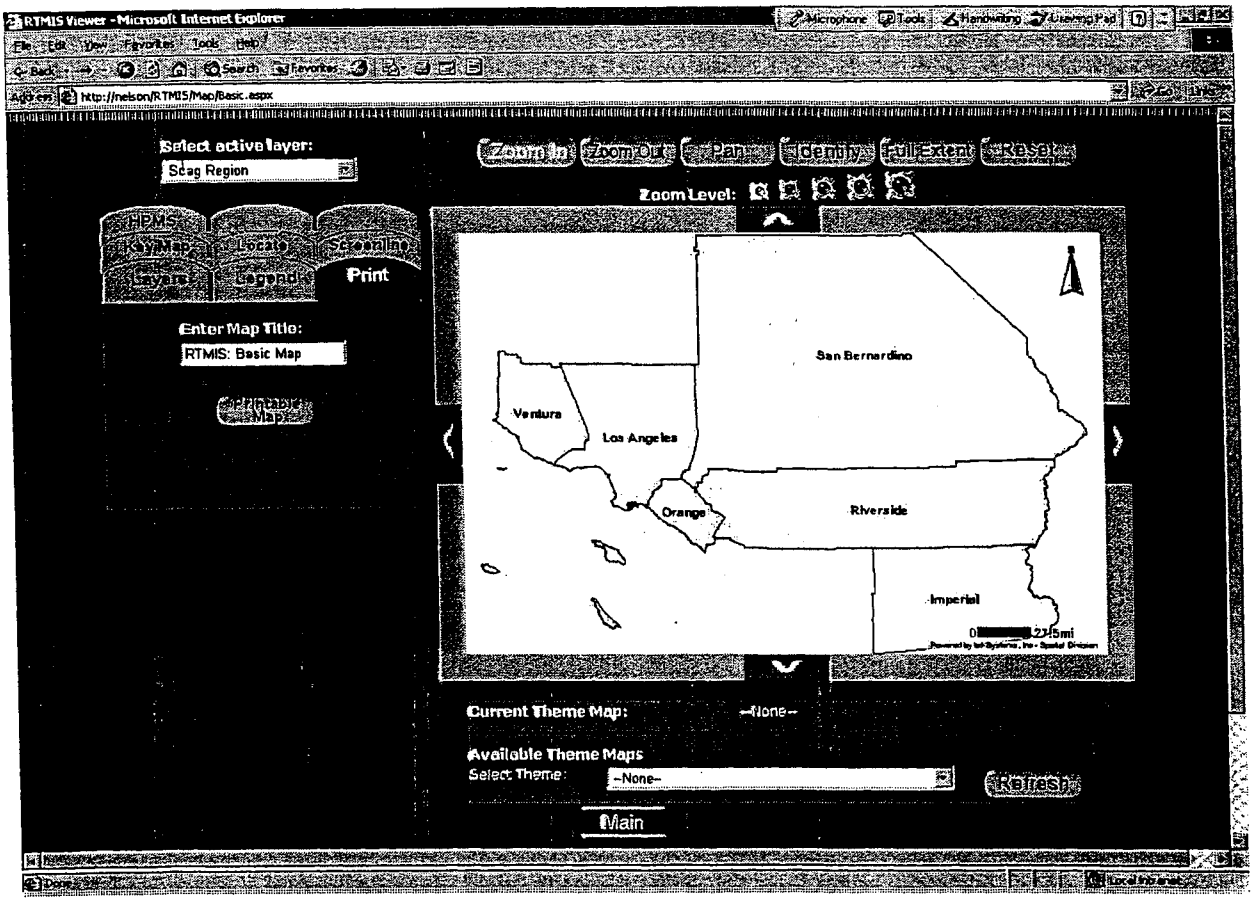
Legend Tab

The legend tab allows users to view the legend for the current map. When the 'Legend' tab is clicked, the legend will automatically display on the tab's interface.

Print tab

The current map can be printed as a hardcopy through the 'Print' tab. To print a map, select the 'Print' tab. Next, the user will be prompted to enter a title for the map, Figure 24.

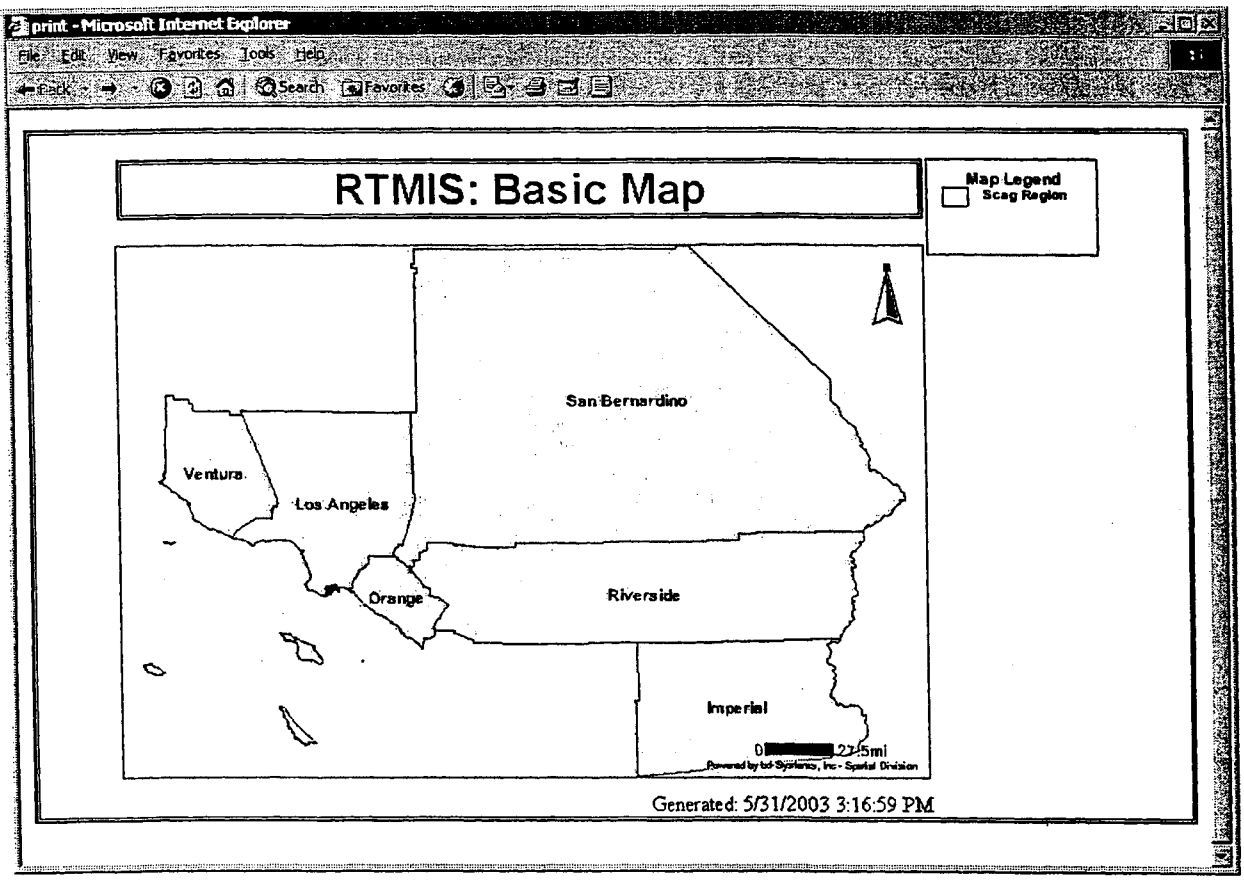
Figure 24. Printing the Map



Once at title has been entered, click on the 'Printable Map' button. When this button is clicked, a new browser window will be launched, Figure 25, displaying a print layout containing the title, map, legend, and the date-time stamp indicating when the map was generated.

Finally, the map can be printed by selecting the File-Print option.

Figure 25. Print Preview



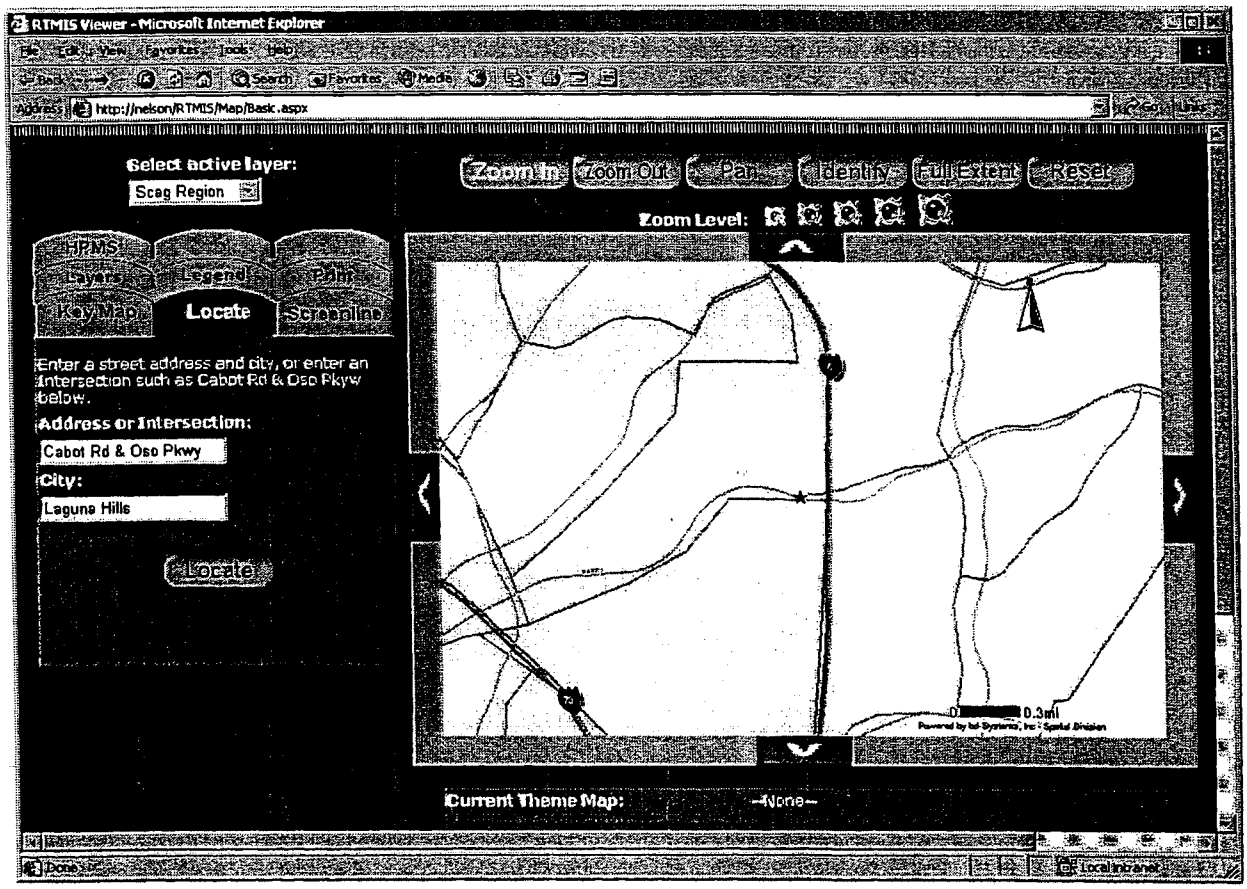
Key Map Tab

A key map shows the zoom extent of the map. Since the RTMIS zoom in and zoom out functions allow for various levels of zooming, the key map tab can be used to see the current map display extent in the context of the entire SCAG region. To view the key map, click on the Key Map Tab. A small image of the SCAG region will display within the tab. The red square on the key map outlines the area within the entire SCAG region that the current map represents.

Locate Tab

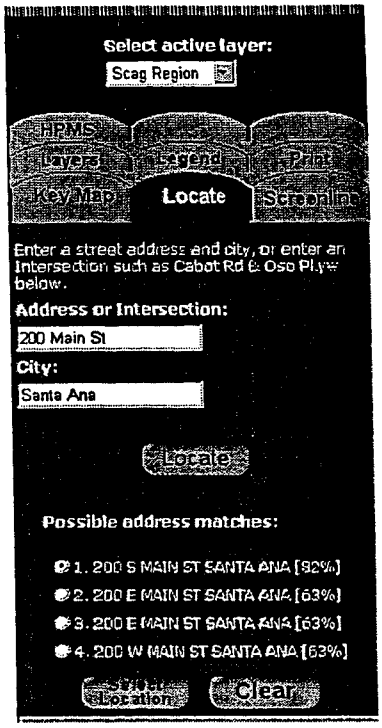
The locate tab allows users to quickly navigate to an Address or Intersection. This is done by clicking on the 'Locate Tab' and entering the appropriate address in the Address/Intersection box. For example, street addresses should be entered as '200 Baker Street' and intersections entered as 'Cabot Rd & Oso Pkwy'. A city name may also be entered. If an exact match is found the location will display on the map as shown in Figure 26 below.

Figure 26. Locate



Often an exact match will not be found. In such instances, several possible matches will be displayed on the Locate Tab from which the user can select. Figure 27 below, shows the results of an address search that did not result in an exact match.

Figure 27. Locate Multiple Matches



To select a match, click on the appropriate option, and then click on the 'Select Location' button to display the location on the map. Option 1 is selected in the figure above.

The remaining two tabs pertain to specific RTMIS function, Screenlines and HPMS data access. These functions are both related to the Highway module, refer to Section 2.4.1 for details regarding the Highway module functions and use.

Screenline Tab

Screenlines are used to select highway segments for loop detector queries as a part of the 'Transportation Performance Indicators' function. A Screenline is a line or set of lines drawn by the user that indicate the freeway segments that can be included in a loop detector query generated by the Loop Detector Wizard accessed through the Highway module. A screenline can be created independently through the 'Mapping' option or within the 'Highway' module. Once a screenline is defined, it is stored for use by the Loop Detector Wizard.

HPMS tab

The HPMS tab is used to access HPMS data. Through the HPMS tab users can a select road segment and view or edit its associate HPMS data. All users will be able to view the data, however editing capabilities are restricted to certain users. Please refer to Section 2.4.1.1 for details about viewing and editing HPMS data.

2.5.2.3 Toolbar/Map Navigation & Query

The Toolbar/Map Navigation & Query section of the mapping interface is comprised of a toolbar and a zoom level scale located above the map display. The toolbar consists of a number of tools that allow users to navigate the map and return information back about a selected feature. Each of these tools is presented below.

Zoom In Button

The Zoom In button located on the toolbar above the map display allows users to zoom into a particular area on the map. The Zoom In button works in coordination with the Zoom Level scale. The level set in the zoom level scale, Figure 28 below, controls the amount of each zoom in action.

Figure 28. Zoom In and Zoom Level buttons

The left most zoom level button sets the smallest level and the right most sets the largest zoom level. A small zoom level will only change the map display in small steps while the largest level will have a greater affect on the map display, it will zoom to a greater degree.

To zoom in to a particular location on the map, select a zoom level and then select the Zoom In button on the toolbar. Next, click on the map display. The map will refresh centered on the location clicked and will zoom in according to the zoom level that has been set.

Zoom Out Button

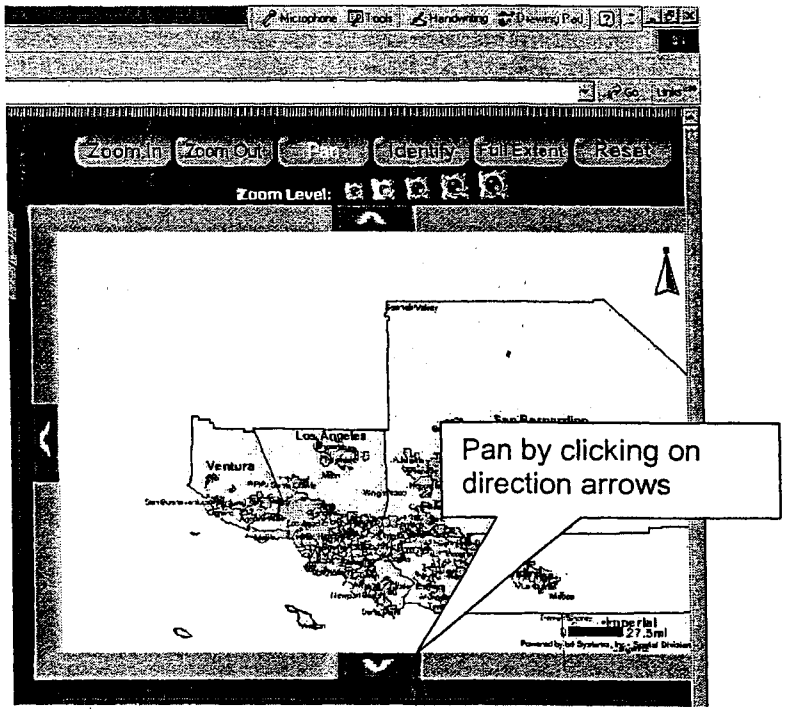
The Zoom Out button allows users to adjust the map extent by zooming out. The Zoom Out button works in coordination with the Zoom Level scale. The level set in the zoom level scale, Figure 29 above, controls the amount of each zoom out action. The left most zoom level button sets the smallest level and the right most sets the largest zoom level. A small zoom level will only change the map display in small steps while the largest level will have a greater affect on the map display, it will zoom to a greater degree.

To zoom out, select a zoom level and then select the Zoom Out button on the toolbar. Next, click on the map display. The map will refresh centered on the location clicked and will zoom out according to the zoom level that has been set.

Pan Button

The user can navigate the map display in any direction by clicking on the 'Pan' button and then clicking on the desired location on the map. The map is re-centered and refreshed according to this new location. In addition to the pan tool, the direction arrows located on the frame around the map display allows the user to move the map north, south, east or west (Figure 29).

Figure 29. Panning Using the Map Direction Buttons



Identify Button

The 'Identify' button is used to select a feature on the map display and return attributes. The identify tool depends on the active layer that is set. Only the attributes belonging to the active layer can be displayed during an identify function. To use the Identify tool, first set the appropriate active layer, for instructions see Section 2.5.2.1. Next zoom to the location of the feature of interest and click on the Identify button on the toolbar. With the Identify tool selected, click on the feature. The feature's attributes will be displayed in a new pop-up window.

Full Extent Button

The 'Full Extent' button resets the zoom extent of the map to the default map, a view of the entire SCAG region. This tool is different the others discussed thus far in that it does not require any interaction with the map display. To zoom the map to the full extent, simply click on the 'full Extent' button. The map display will automatically refresh.

Reset Button

The reset tool will return the map display to its default state. When the 'Reset' tool is clicked, the map display will automatically refresh to the initial map view of the entire SCAG region. In addition, the map layers are also returned to their default settings. By default, only the 'SCAG Region' and 'TBM major' layers are checked on.

2.5.2.4 Thematic Mapping

The final map interface section is the Thematic Map section located below the map display. This section will display as seen in Figure 30, until a thematic map has been created through the Loop Detector Wizard accessible through the Highway module. Once one or more maps have been created and mapped through the Loop Detector wizard the section appear as seen in Figure 31 below.

Figure 30. Default Thematic Mapping

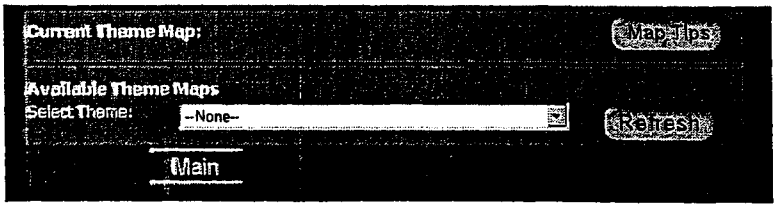
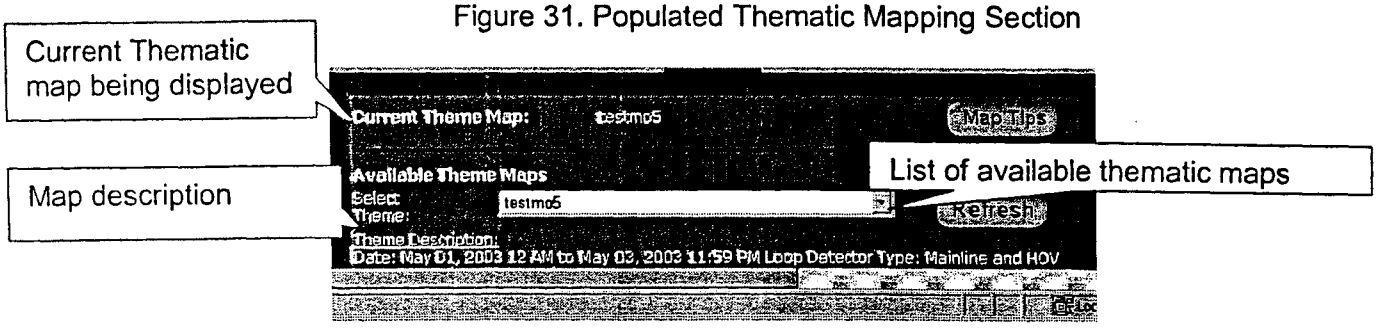


Figure 31. Populated Thematic Mapping Section



The Thematic Map section displays which map is currently being displayed if any and allows users to view a list of maps they have generated during their session and obtain a description about the map.

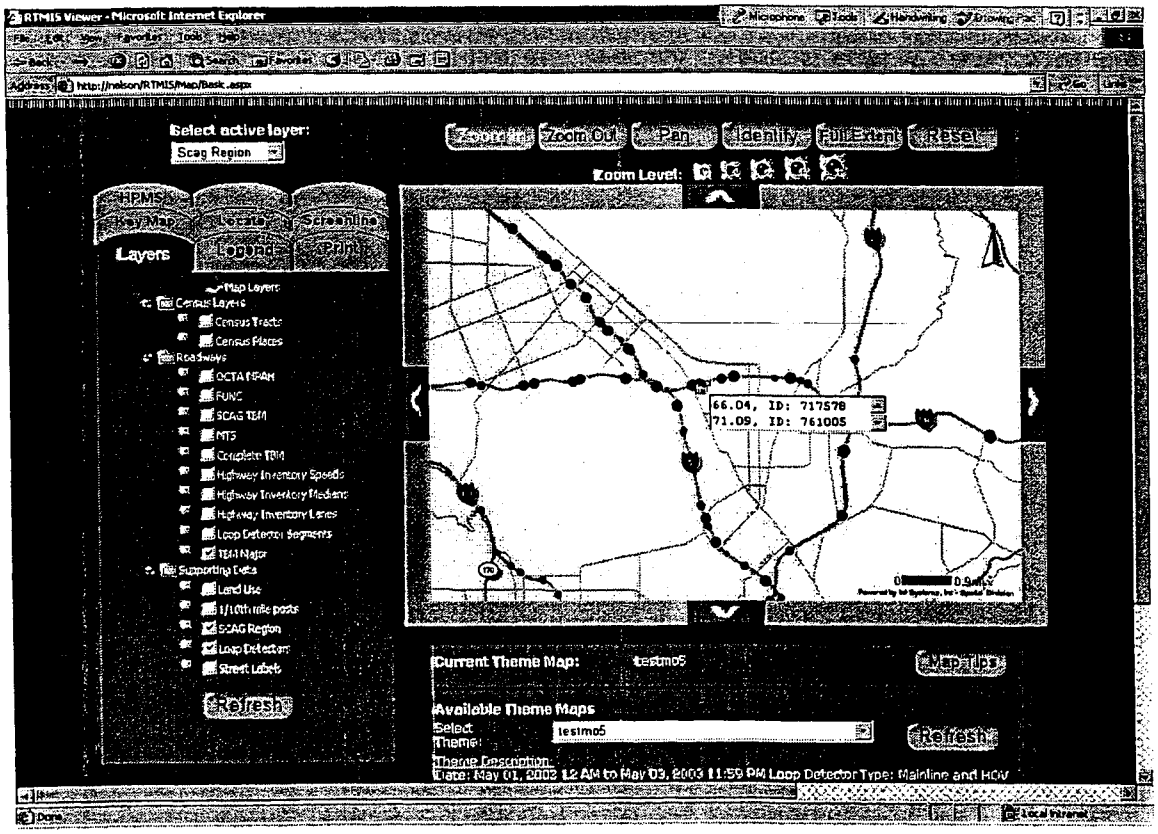
To select a new thematic map for display, click a map title from the drop-down list, verify the map through the description displayed and click the 'Refresh' button located in the Thematic Mapping section. This action will refresh the map display to show the selected map.

Another function available through the thematic mapping section is Map Tips.

Map Tips

Map Tips provide a value for the element mapped, such as average speed, and the loop detector ID. Map tips can only be accessed when a thematic map is displayed, and the user has zoomed into an appropriate level. When these criteria have been meet the 'Map Tips' button will display. To view map tips, click on the 'Map Tips' button. When the button is clicked the application will retrieve the relevant values for the loop detectors shown in the current map extent. Once the values have loaded, when the mouse hovers over a loop detector on the map display, a map tip will appear as shown in Figure 32 below.

Figure 32. Map Tips



This guide has presented each of the main functions of the RTMIS web interface and has detailed how each of these functions can be accessed and utilized as well as identify several future enhancements that are planned such as the additional mobility modes, Aviation, Transit, Non-Motorized and Maritime. The following appendix has been provided for reference for those users with system administrator privileges. The appendix will detail additional RTMIS functions that are available only to system administrators.

3 APPENDIX

3.1 SYSTEM ADMINISTRATOR FUNCTIONS

RTMIS has several system administration functions available online through the RTMIS web interface. Only users assigned with the role of System Administrator can access these functions. As described briefly in Section 2.2, *User Classifications*, RTMIS utilizes a login security system comprised of user accounts defined with specific authorization levels or roles. The following section will discuss the types of user roles available in RTMIS and describe in greater detail how they are implemented and utilized by RTMIS.

User Roles were implemented to provide flexibility to RTMIS and to allow certain functions or data to be shared unrestricted while retaining the ability to easily protect or restrict specific functions such as data editing capabilities. The following table details the six roles available for RTMIS users.

Table 2. Summary of RTMIS User Roles

User Role	Description
Public	Most restricted, only viewing allowed
Outside Agency Basic	Viewing and some editing functions (HPMS) allowed
Outside Agency Full	Viewing and some editing functions (HPMS) allowed
SCAG Agency Basic	Viewing and some editing functions (HPMS) allowed
SCAG Agency Full	Viewing and some editing functions (HPMS) allowed
System Administrator	The administrator can edit and view all modules

RTMIS determines user classifications levels by mapping different applications to the user roles defined above. Table 2 below details these different applications.

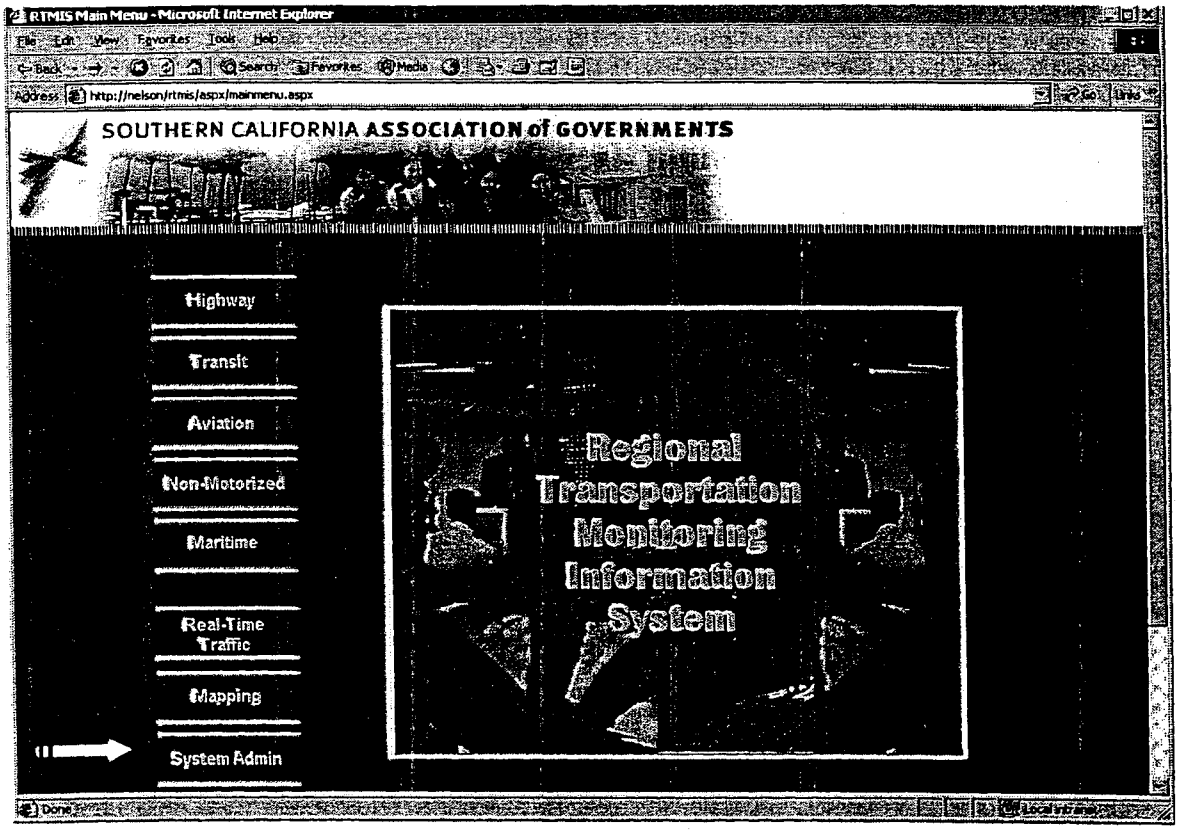
Table 3. Summary of RTMIS Applications

Application	Description
FTP2Disk Data Loader	Down loads data from the PeMS FTP site.
Disk2Prestage Data Loader	Aggregates and moves downloaded data from pre-staging database to staging database.
Prestage2Staging Data Loader	Moves data from pre-staging database to staging database.
RTMIS Web Application	The RTMIS Web Interface.

Various privileges such as editing and viewing depend on both the application the user is assigned to and the user role identified with the user. User roles limit access to system administration functions to a limited number of users or to a single user who will administer the system. This remainder of this appendix will describe the administrator functions and how to use them to administer RTMIS.

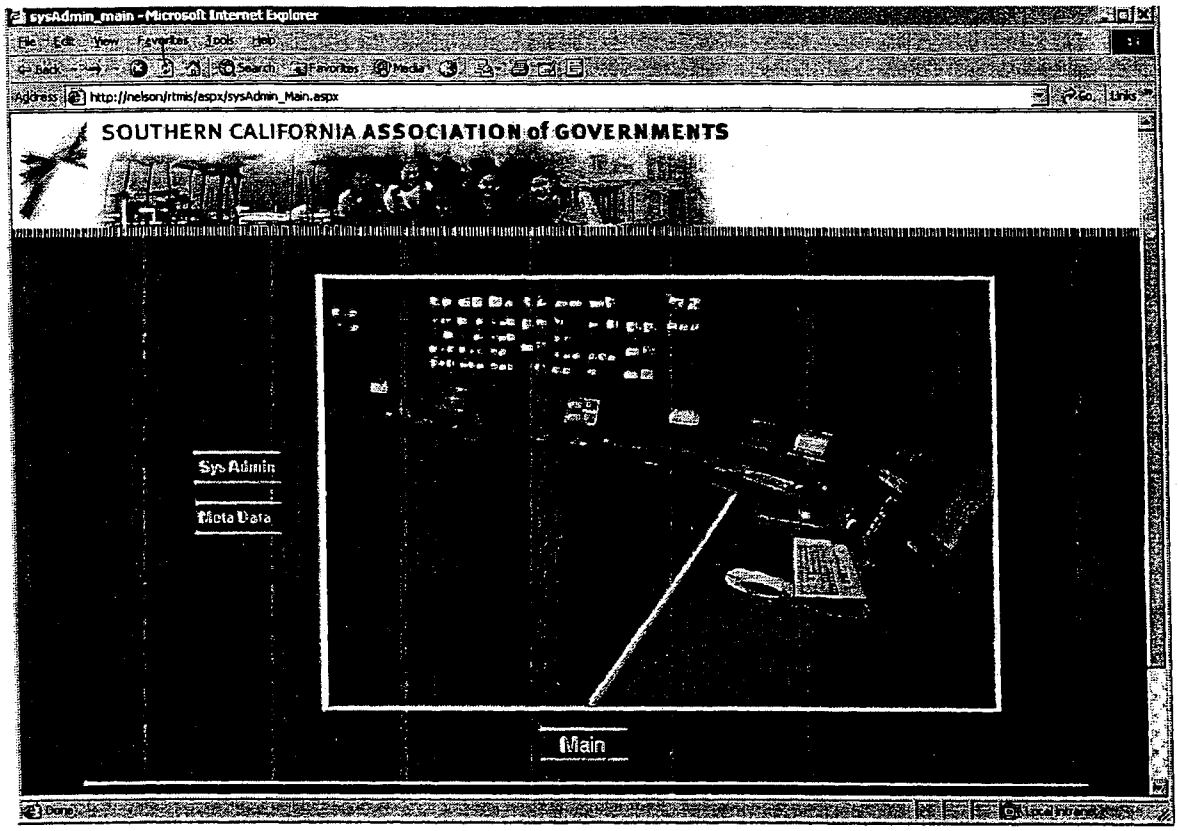
System Administrators log into and access RTMIS, as would any other user, refer to section 2.3, *Main Menu*, for details. In addition to the links available to other RTMIS users, system administrators will have access to a System Admin link on the main page as illustrated in Figure 33 below. This link provides access to all of the system administration functions with the exception of administering HPMS data, which will be addressed later in this appendix.

Figure 33. RTMIS Main Page – System Administrator



When 'System Admin' is clicked on the main page, the System Administration Sub-Menu Page will be displayed, Figure 34 below. The System Administration Sub-Menu provides access to specific system administration functions as well as to the systems metadata.

Figure 34. System Administration Sub-Menu Page



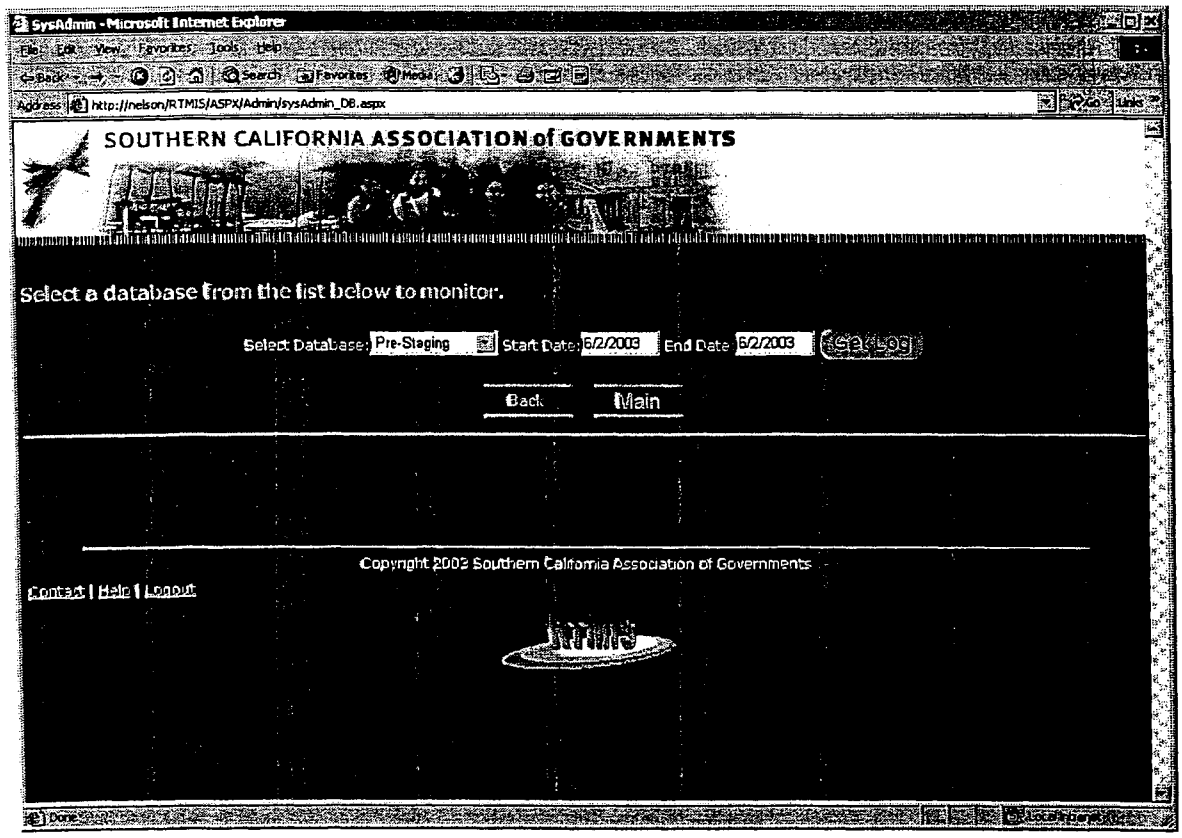
3.1.1 System Administration

The System Administration Module provides system administrators with several functions to administer RTMIS such as Database Monitoring, Application Management, User Management, and Notification Management. Each of these functions will be described in detail below.

3.1.1.1 Database Monitoring

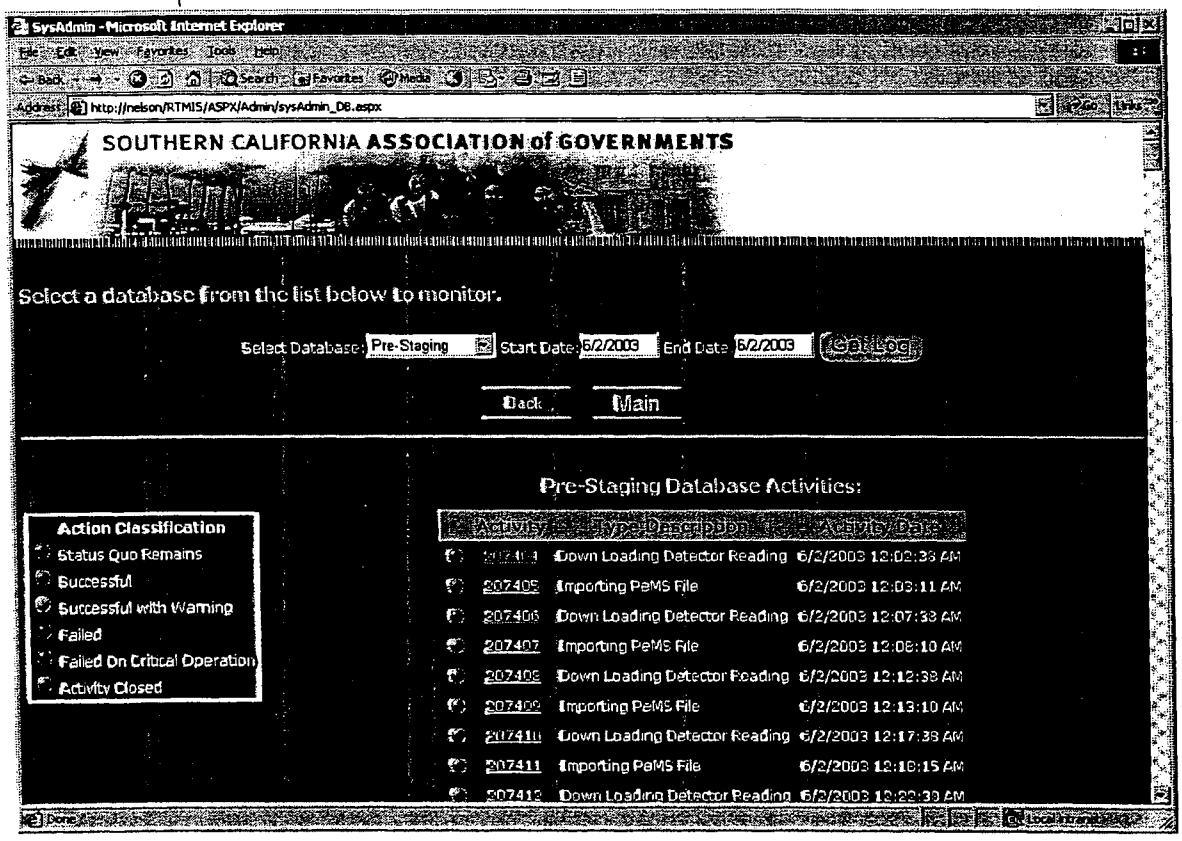
The Database Monitoring module provides system administrators with the ability to monitor the various databases utilized by RTMIS. To access the Database Monitoring module, click the 'Monitor' button on the System Administration Sub-Menu Page. The following page displayed in Figure 35 will then display.

Figure 35. Database Monitoring



To monitor a RTMIS database follow the following steps. First, select a database from the drop-down list. Next, enter a start and end date to define a time period of interest. Finally, click the 'Get Log' button to display the database activities that transpired during the time period specified. Once the request has been processed a log of all the activities will be displayed on the page as shown in Figure 36 below.

Figure 36. Database Monitoring Log



Each activity can be reviewed individually by clicking on the activity number link. This action will launch a new browser window, which will display a listing of associated actions that occurred during the selected activity. Figure 37 illustrates the action listing form Activity 207404.

Figure 37. Database Monitoring: An Action Listing

Each activity is comprised of one or more associated actions. The database monitoring function allows system administrators to review activities and actions for failure patterns and general system health.

3.1.1.2 Application Management

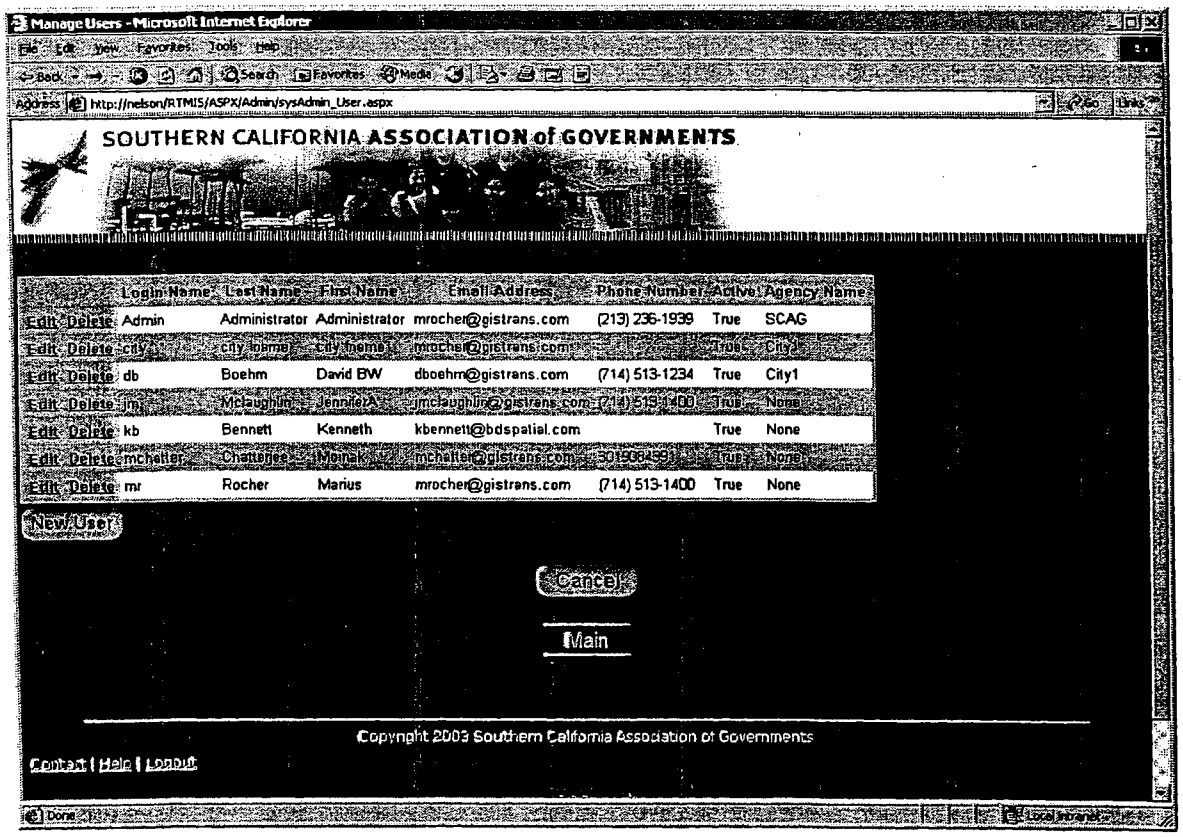
The Application Management module is scheduled for completion in the future and is currently under construction. To access the application management function, click the 'Applications' button on the System Administration Sub-Menu Page. Currently, when clicked an 'Under Construction' message will be displayed.

3.1.1.3 User Management

The User Management module allows system administrators to edit, maintain, and add new user accounts for RTMIS. The module is accessed by clicking on the 'Users' button on the System Administration Sub-Menu Page. When 'Users' is clicked on the following page shown

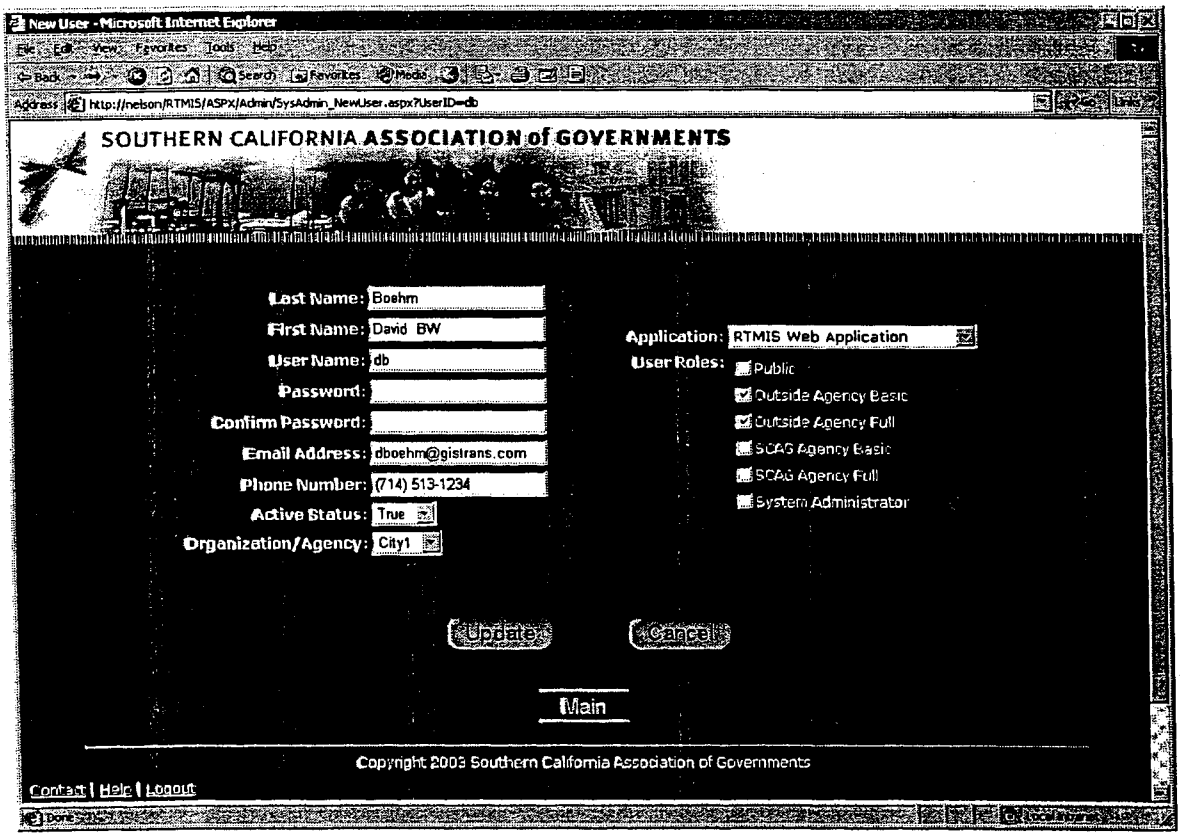
in Figure 38. below is displayed. From this page system administrators can manage the RTMIS user accounts.

Figure 38. User Management: User Summary Page



To edit an existing user account click on the 'Edit' link for a specific user. A user form will then be displayed and the system administrator can edit the current user information and update the account by clicking the 'Update' button. Figure 39 below displays an example user form.

Figure 39. User Management: Editing User Accounts



The user form will also display when a new user is being created. System administrators may create new user accounts by clicking the 'New User' button on the User Summary Page. When a new user is being created the user form will display as an empty form where system administrators can enter user information and construct a user account.

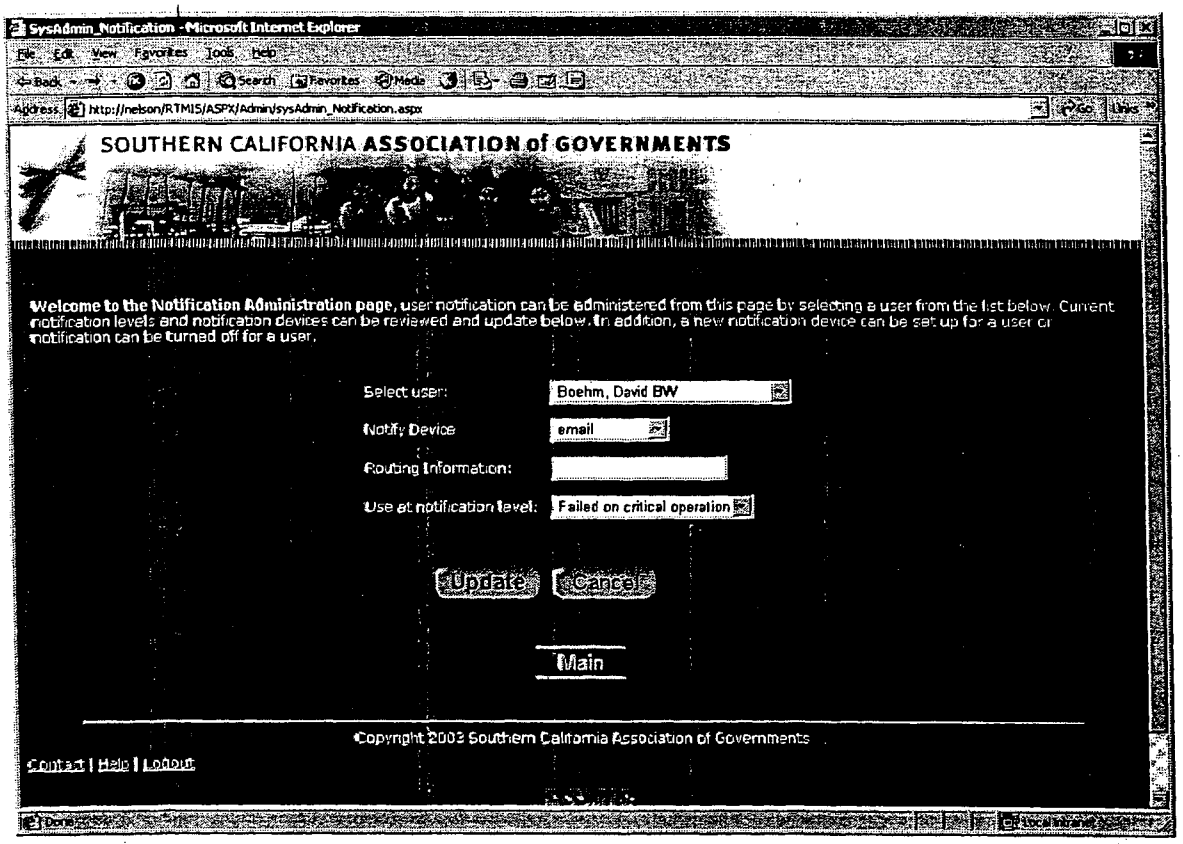
User accounts can also be deleted by clicking the 'Delete' link for a particular user on the User Summary Page. This action will permanently remove the user account and should be used cautiously.

3.1.1.4 Notification Management

The Notification Management module allows system administrators to edit and manage the automatic RTMIS notification emails. A notify level and device can be set for each user as well as specific routing information. To access the Notification Management module, click on the

'Notifications' button on the System Administration Sub-Menu Page. This action will display a notification form as seen in Figure 40 below.

Figure 40. Notification Management: Notification Form



System administrators can select a user from the drop-down list and review current notification settings and update them as needed. To update a user's notification form after making edits, click the 'Update' button to save changes.

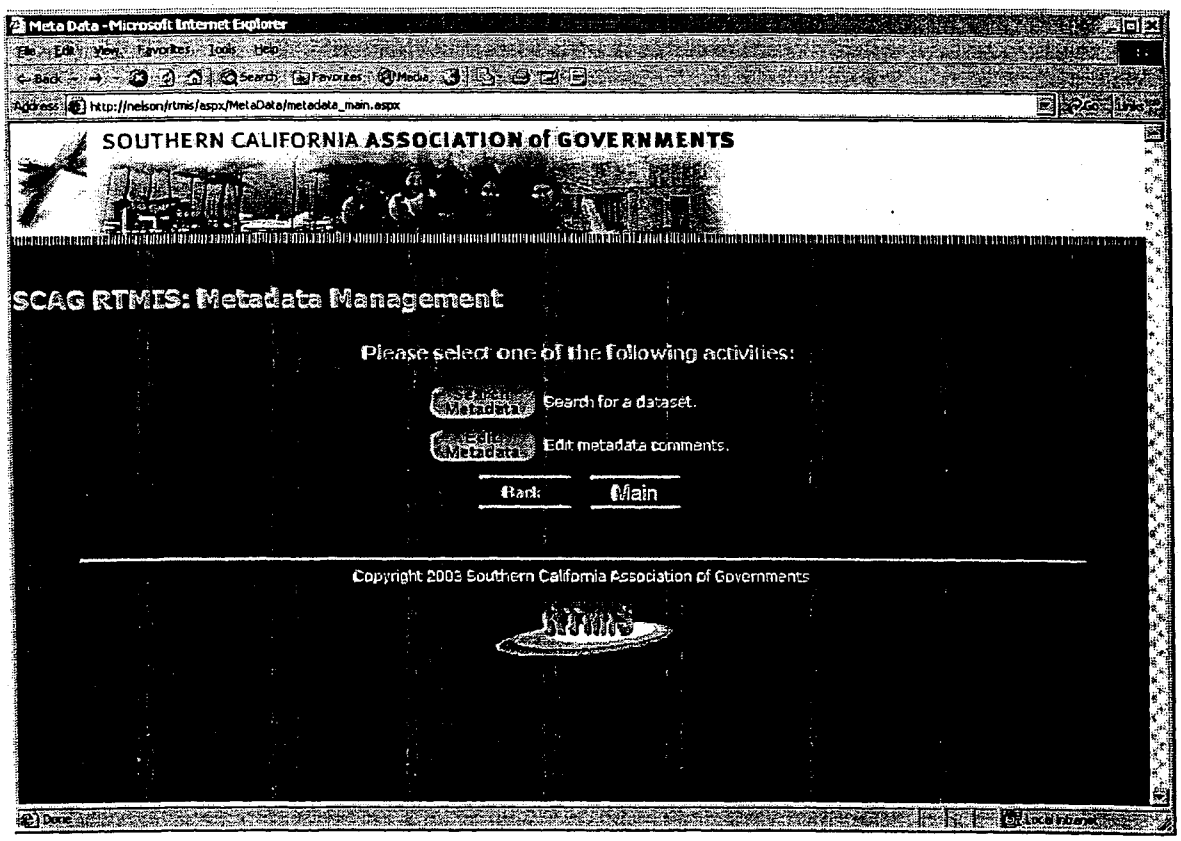
The System Administration option provides users with system administration roles access to many online functions designed to simplify the system administration oversight required to maintain RTMIS. The second option available on the Main System Administration Menu Page, Meta Data will be detailed in the next section.

3.1.1.5 Meta Data

The Meta Data module is scheduled for completion in the future and is currently under construction. When Meta Data is selected from the System Administration Menu Page the Meta Data Menu Page is displayed, as shown in Figure 41 below. Currently the Meta Data module is scheduled to contain two functions, the ability to search for a meta data set and the

ability to edit and update meta data comments. Currently, these two links will display an 'Under Construction' message.

Figure 41. System Administration Page



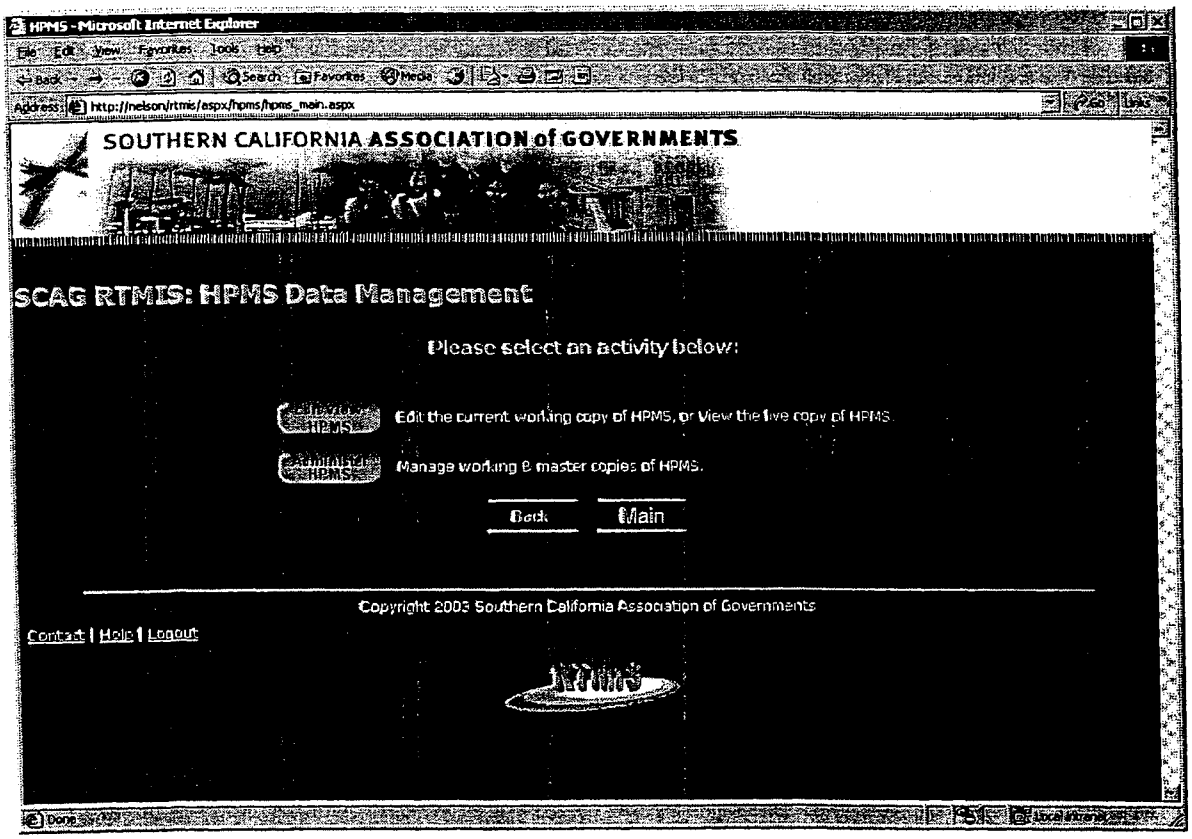
In addition to the system administration functions already detailed above, users with system administrator roles can administer HPMS data.

3.2 HPMS Data Administration

HPMS data administration tasks include maintaining the Master and Working copies of the RTMIS HPMS data. RTMIS utilizes maintains three copies of the HPMS data, a working or editable copy, a master copy, and an archive copy. The remainder of this section will detail how RTMIS utilizes and can be used to maintain and administer these copies.

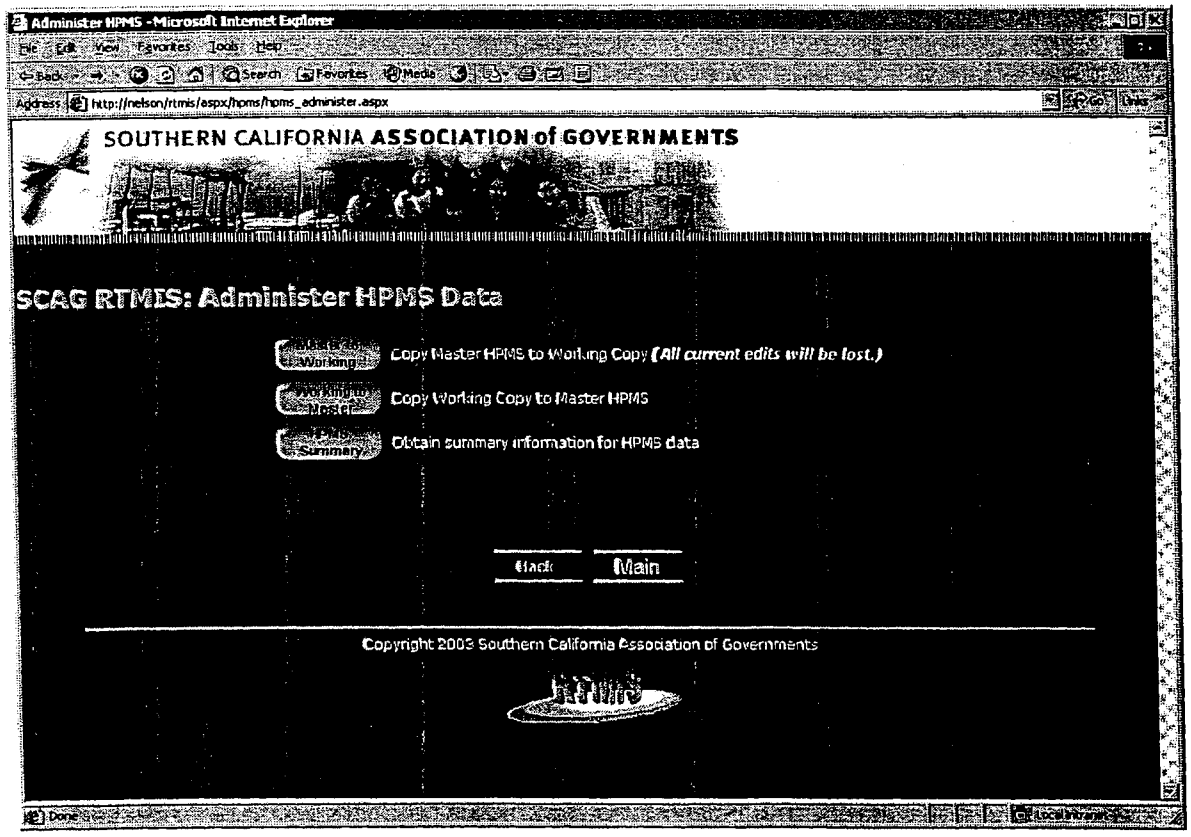
To administer HPMS data, select 'Highway' from the main page and then select 'Transportation Infrastructure Inventory' from the Highway Menu Page. System administrators will have an 'Administer HPMS' button in addition to the 'Edit/View' HPMS button option as shown in Figure 42 below.

Figure 42. Transportation Infrastructure Inventory Menu Page – System Administrator



To administer HPMS data click on the 'Administer HPMS' button from the menu. The following page shown in Figure 43 below will be displayed.

Figure 43. HPMS Administration Menu Page



The HPMS Administration Menu Page provides system administrators access to the following functions: copying the Master HPMS to the Working copy, copying the Working copy to the Master HPMS, and obtaining summary information on the status of the HPMS data.

3.2.1 Copying the Master HPMS to the Working Copy

System administrators may copy the current master HPMS to the Working HPMS as needed. **This action will cancel or omit any online edits made to the current working copy of the HPMS.** This functionality allows users to revert or rollback HPMS edits made online by various RTMIS users.

To copy the Master HPMS to the Working copy, click on the 'Master to Working' button on the HPMS Administration Menu Page. A completion notification will display on page to the right of the button once the process has completed successfully.

3.2.2 Copying the Working Copy to the Master HPMS

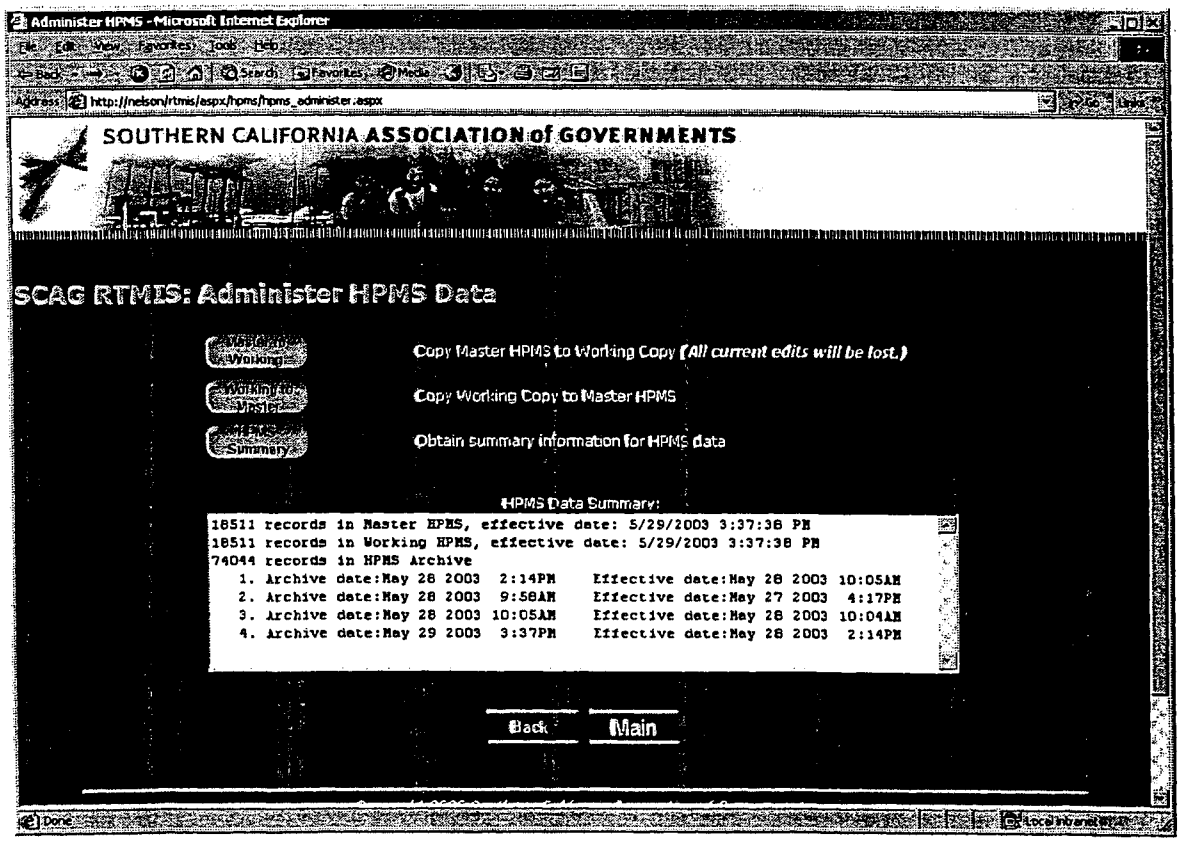
Systems administrators may copy the current Working copy to the Master HPMS. This action will accept any HPMS edits that have been made online by various RTMIS users. When this option is selected, the current Master HPMS is copied to the Archive copy first and then the current working is copied to the Master HPMS thereby becoming the new Master copy.

To copy the Working copy to the Master HPMS, click on the 'Working to Master' button on the HPMS Administration Menu Page. A completion notification will display on page to the right of the button once the process has completed successfully.

3.2.3 Obtaining Summary Information

The final HPMS administration option, obtaining summary information, allows system administrator to review the status of the HPMS data. It provides details such as the number of records and effective date for the Master, Working, and Archive copies. An example of the summary information provided by RTMIS is shown in Figure 44 below.

Figure 44. HPMS Summary Information



To obtain a HPMS data summary, click the 'HPMS Summary' button on the HPMS Administration Menu Page. RTMIS will then display the summary results back to the page as seen in Figure 44 above.